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TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, [redacted] 1919

No. [redacted] 165

THE UNITED STATES OF AMERICA, APPELLANT,

vs.

UNITED STATES STEEL CORPORATION ET AL.

APPEAL FROM THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF NEW-JERSEY.

VOLUME 7.

GOVERNMENT EXHIBITS.

FILED MAY 12, 1916.

UNITED STATES

vs.

UNITED STATES STEEL CORPORATION

GOVERNMENT EXHIBITS, VOL. VII.

Government Exhibit	*Subject*	*Page*
No. 312	Extract from page 65 of the Annual Statistical Report of the American Iron and Steel Association for 1902, entitled "Statistics of The United States Steel Corporation"	2007
No. 313	Extract from page 77 of the Annual Statistical Report of the American Iron and Steel Association for 1905, entitled "Statistics of The United States Steel Corporation for the calendar year 1902"	2008
No. 314	Extract from page 78 of the Annual Statistical Report of the American Iron and Steel Association for 1905, entitled "Statistics of the United States Steel Corporation for the calendar year 1903"	2009
No. 315-316	Extract from page 79 of the Annual Statistical Report of the American Iron and Steel Association for 1905, entitled "Statistics of The United States Steel Corporation for the calendar year 1904"	2010
No. 317	Extract from page 81 of the Annual Statistical Report of the American Iron and Steel Association for 1906, entitled "Statistics of The United States Steel Corporation for the calendar year 1905"	2011
No. 318	Extra from page 82 of the Annual Statistical Report of the American Iron and	

Government Exhibit	*Subject*	*Page*
	Steel Association for 1906, entitled "Statistics of The United States Steel Corporation for the calendar year 1906"	2012
No. 319	Extract from page 87 of the Annual Statistical Report of the American Iron and Steel Association for 1907, entitled "Statistics of The United States Steel Corporation for the calendar year 1907"	2013
No. 320	Extract from page 94 of the Annual Statistical Report of the American Iron and Steel Association for 1909, entitled "Statistics of The United States Steel Corporation for the calendar year 1908"	2014
No. 321	Extract from page 99 of the Annual Statistical Report of the American Iron and Steel Association for 1910, entitled "Percentage of Production of The United States Steel Corporation for 1909"	2015
No. 322	Extract from page 100 of the Annual Statistical Report of the American Iron and Steel Association for 1910, entitled "Percentage of Production of The United States Steel Corporation for 1910"	2016
No. 323	Table entitled "Iron and Steel Statistics for 1898, 1899 and 1900," showing the production of pig iron, steel ingots, castings, etc., in the United States	2017
No. 324	Table entitled "Comparative Production of all kinds of finished rolled iron and steel by the subsidiary companies of The United States Steel Corporation and by the independent companies in 1905 and 1910"	2019
No. 325	Directory to the Iron and Steel Works of the United States, published by the American Iron and Steel Association, 14th edition, corrected to April 1, 1898	2020

Government Exhibit	*Subject*	*Page*
No. 326	Supplement to the Directory to the Iron and Steel Works of the United States, compiled by the American Iron and Steel Association, second edition, corrected to August 15, 1900	2020
No. 327	Excerpts from the Directory to the Iron and Steel Works of the United States for 1901, compiled by the American Iron and Steel Association, corrected to December 31, 1901	2020
No. 328	Excerpts from the Directory to the Iron and Steel Works of the United States for 1890, compiled by the American Iron and Steel Association, corrected to November, 1889, with addenda	2113
No. 329	Table showing comparative production of all kinds of finished rolled iron and steel by the subsidiary companies of the United States Steel Corporation and by the independent companies in 1906..	2119
No. 330	Extract from pages 58 and 59 of the Annual Statistical Report of the American Iron and Steel Association for 1910, entitled "Production of Pig Iron by Grades"	2120
No. 331	Extract from page 81 of the Annual Report of the American Iron and Steel Association for 1910, showing the production of iron and steel plates and sheets since 1905	2121
No. 332	Extract from page 82 of the Annual Report of the American Iron and Steel Association for 1910, showing the production of black plates or sheets for tinning, by States	2122
No. 333	Extract from page 84 of the Annual Statistical Report of the American Iron and Steel Association for 1910, showing the	

Government Exhibit	*Subject*	*Page*
	production of nail and spike plate, by States	2123
No. 334	Extract from pages 10 and 11 of the Annual Statistical Report for 1909 of the American Iron and Steel Association, showing production of miscellaneous rolled products	2124
No. 335	See Government Exhibit No. 356 which covers the subject matter thereof	2125
No. 336	See Government Exhibit No. 357 which covers the subject matter thereof	2125
No. 337	See Government Exhibit No. 358 which covers the subject matter thereof	2125
No. 338	(For identification.) See Volume VII. of the Testimony, page 2885	2125
No. 339	Letter of November 4, 1907, from President Roosevelt to Attorney General Bonaparte regarding purchase of stock of Tennessee Coal Company	2125
No. 340	Extract from "The Iron and Steel Works of the United States, 1908," regarding Tennessee Coal, Iron and Railroad Company	2127
No. 341	Extract from pages 1346-1348 of "The Iron Age" of May 2, 1907, regarding The Tennessee Coal, Iron & Railroad Company's Report	2132

(GOVERNMENT EXHIBIT No. 323, December 17, 1912.)

Statement B--1

IRON AND STEEL STATISTICS FOR 1898,1899, AND 1900.

* * * *

The following table gives the production of pig iron, steel ingots and castings, various forms of finished rolled iron and steel, and wire nails in the United States from 1898 to 1900 inclusive by plants which were then owned or operated or which were subsequently acquired by the subsidiary companies of the United States Steel Corporation, with the exception of the production of plants owned or operated by the Tennessee Coal, Iron, and Railroad Company, as compared with the production in the same years of plants which were not owned or operated by the subsidiary companies of the Steel Corporation, not including the production of tinplates and terne plates. The production of the Tennessee Company is NOT INCLUDED, therefore, in column 2 with the production of the other subsidiary companies of the Corporation, but is included in column 3 with the output of plants not acquired by the Corporation.

Products	Production of plants acquired by Corporation at various times.	Production of plants not acquired by Corporation, including Tennessee Coal, Iron and R.R.Co.	Total Production.	Percentage of plants acquired by Corporation.	Percentage of plants not acquired by Corporation.
1.	2.	3.	4.	5.	6.
Pig Iron.					
1898.....	5,441,701	6,338,233	11,713,934	46.22	53.78
1899.....	5,990,119	7,730,584	13,640,703	43.25	56.75
1900.....	5,668,601	8,123,641	13,789,242	41.09	58.91
Ingots and Cast					
1898.....	4,846,888	1,762,129	6,609,017	73.34	26.66
1899.....	5,456,326	2,132,028	7,588,354	71.95	28.05
1900.....	4,667,007	2,017,763	6,684,770	69.82	30.18

Statement B--2

1.	2.	3.	4.	5.	6.
O. H. Ingots & Castings.					
1898.....	1,317,865	912,427	2,230,292	59.09	40.91
1899.....	1,739,572	1,207,744	2,947,316	59.02	40.98
1900.....	2,041,968	1,356,167	3,398,135	60.09	39.91
Bessemer Steel Rails.					
1898.....	1,249,271	727,431	1,976,702	63.20	36.80
1899.....	1,361,011	909,574	2,270,585	59.94	40.06
1900.....	1,452,118	931,536	2,383,654	60.92	39.08
Open-Hearth Steel Rails.					
1898.....	0	1,220	1,220	0	100.00
1899.....	0	523	523	0	100.00
1900.....	0	1,333	1,333	0	100.00
Wire Rods.					
1898.....	1,044,277	27,406	1,071,683	97.44	2.56
1899.....	981,486	54,918	1,036,396	94.70	5.30
1900.....	700,378	145,913	846,291	82.76	17.24
Structural Shapes.					
1898.....	465,639	236,558	702,197	66.31	33.69
1899.....	559,909	290,467	850,376	65.84	34.16
1900.....	494,974	320,187	815,161	60.72	39.28
Plates and Sheets.					
1898.....	977,550	470,751	1,448,301	67.50	32.50
1899.....	1,232,750	670,755	1,903,505	64.76	35.24
1900.....	1,195,508	599,020	1,794,528	66.62	33.38
All Other Rolled Iron and Steel.					
1898.....	921,849	2,391,418	3,313,267	27.82	72.18
1899.....	1,256,663	2,976,369	4,233,032	29.69	70.31
1900.....	990,753	2,655,723	3,646,476	27.17	72.83
Total Rolled Iron & Steel					
1898.....	4,658,586	3,854,784	8,513,370	54.72	45.28
1899.....	5,391,819	4,902,800	10,294,419	52.38	47.62
1900.....	4,833,731	4,653,712	9,487,443	50.95	49.05
Wire Nails.					
1898.....	6,600,257	818,218	7,418,475	88.97	11.03
1899.....	6,553,970	1,064,160	7,618,130	86.03	13.97
1900.....	5,265,947	1,968,032	7,233,979	72.79	27.21

In the above statement theproduction of the Tennessee Coal, Iron, and Railroad Company is NOT INCLUDED in column 2 but is included in column 3. The percentages of the company are included in column 6.

Government Exhibit
December 17

Note.--The production of the Tennessee Coal, Iron and Railroad Company is i
1905 but for 1910 it is included with the production of the subsidia

COMPARATIVE PRODUCTION OF ALL KINDS OF FINISHED ROLLED IRON AND STEEL BY TH

THE INDEPENDENT COMPANI

Products	1905--GROSS TONS				
	Production			Percentag	
	Corporation	Independents	Total	Corporation	Inde
Bessemer Steel Rails..	1,713,610	1,478,737	3,192,347	53.68	
Open-Hearth S. Rails..	15,685	167,579	183,264	8.56	
Iron Rails.....	0	318	318	0	1
Structural Shapes...	908,096	752,423	1,660,519	54.69	
Plates--No. 12 gauge and thicker..... ..	1,166,019	875,187	2,041,206	57.12	
Sheets--No. 13 gauge and thinner.....	862,410	628,614	1,491,024	57.84	
Black Plates for tinning, included with Plates and Sheets...	349,562	158,025	507,587	68.87	
Wire Rods.....	1,265,707	543,951	1,809,658	69.98	
Nail Plate.....	0	64,542	64,542	0	1
Miscellaneous Rolled Products, including:					
1--Merchant Bars.....	600,754	2,992,847	3,593,601	16.72	
2--Skelp.....	744,278	691,717	1,435,995	51.83	
3--Hoops, Bands and Cotton Ties.....	335,978	109,549	445,527	75.41	
4--Splice Bars.....	129,891	67,431	197,322	65.82	
5--Rolled Forging Blooms and Rolled Forging Billets...	0	41,754	41,754	0	1
6--Concrete Bars, Sheet Piling, Railroad Ties, Spike & Chain Rods, Bolt & Nut Rods, Horse Shoe Bars, Strips and other Misc. rolled	236,527	447,381	683,908	34.58	
Total.....	7,978,955	8,861,060	16,840,015		

ay) No. 324
912

ded with the production of the independent companies for the year
ompanies of the United States Steel Corporation.

UBSIDIARY COMPANIES OF THE UNITED STATES STEEL CORPORATION AND BY
IN 1908 AND 1910

	1910--GROSS TONS				
	Production			Percentage	
dents	Corporation	Independents	Total	Corporation	Independents
38	1,134,381	780,061	1,914,442	60.39	39.95
44	1,004,866	746,794	1,751,659	57.36	42.64
00	0	230	230	0	100.00
31	1,163,300	1,103,890	2,268,190	51.32	48.68
88	1,320,872	1,487,456	2,807,728	47.02	52.98
16	1,059,834	1,087,902	2,147,736	49.35	50.65
13	441,406	270,711	712,137	61.99	38.01
02	1,508,634	733,936	2,241,230	67.26	32.74
00	0	45,294	45,294	0	100.00
36	894,494	2,891,237	3,785,731	23.63	76.37
17	699,720	988,494	1,888,194	49.21	50.79
59	466,504	221,589	687,193	67.74	32.26
13	100,518	102,564	203,082	54.04	45.96
00	242,684	217,269	459,933	52.76	47.24
40	580,399	911,278	1,491,677	38.91	61.09
	10,393,935	11,227,354	21,621,279		

Government Exhibit No. 325.

(December 17, 1912.)

Directory to the Iron and Steel Works of the United States, published by the American Iron and Steel Association, 14th. edition, corrected to April 1, 1898.

(It was agreed among Counsel that the above Exhibit was not to be printed.)

Government Exhibit No. 326.

(December 17, 1912.)

Supplement to the Directory to the Iron and Steel Works of the United States, containing a complete list of the Consolidated Iron and Steel Companies in the United States, compiled by the American Iron & Steel Association, Second Edition, corrected to August 15th, 1900.

(It was agreed among Counsel that the above Exhibit was not to be printed.)

Government Exhibit No. 327.

(December 17, 1912.)

(Comprising the following excerpts from the Directory to the Iron and Steel Works of the United States for 1901, compiled by the American Iron and Steel Association, corrected to December 31, 1901.)

Government Exhibit No. 325.

(December 17, 1912.)

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(Comprising the following excerpts from the Directory to the Iron and Steel Works of the United States for 1901, compiled by the American Iron and Steel Association, corrected to December 31, 1901.)

(Title Page.)

DIRECTORY

TO THE

IRON AND STEEL WORKS OF THE
UNITED STATES.

Embracing a full list of the Blast furnaces, rolling mills, steel works, rail mills, structural mills, plate and sheet mills, steel casting works, tin plate works, wire-rod mills, cut-nail works, wire-nail works, and forges and bloomaries, with full particulars of equipment, products, ownership, officers, and all recent consolidations.

To which is added a complete list of the iron and steel works of Canada.

Compiled and published by
THE AMERICAN IRON AND STEEL ASSOCIATION.

Fifteenth Edition.
Corrected to December 31, 1901.

Philadelphia:
THE AMERICAN IRON AND STEEL ASSOCIATION,
No. 261 South Fourth Street
1901.

(From Pages 1 to 69.)

THE IRON AND STEEL WORKS OF THE UNITED STATES.

Part I—Chiefly Consolidations.

Corrected to August 31, 1901.

In previous editions of the Directory the descriptions of all iron and steel works have been so arranged that the furnaces were classified together, the rolling mills and steel works by themselves, etc., etc. By this arrangement furnaces and rolling mills and steel works owned by the same firm or company were often widely separated. The consolidation in recent years of so many iron and steel enterprises that had previously been independently operated makes it not only possible but absolutely necessary to now group a large number of iron and steel works according to ownership rather than with regard to their technical character or geographical location, the latter considerations being secondary to ownership. The geographical classification by States heretofore observed is retained, however, wherever possible, but in combination with the new feature of grouping together all works owned by one firm or company. This new feature is especially prominent in Part I, but in Part II it is made subordinate to geographical divisions.

In Part I of the Directory are included all the numerous consolidations that have taken place in the last few years. The organization of each of the consolidations is given with sufficient fullness, including the capitalization, list of officers, etc., and also a complete description of the properties owned or controlled by it. Since the last edition of the Directory was published in 1898 there have been many consolidations, and the changes in ownership have affected hundreds of

2021

plants. The utmost pains have been taken to correctly note all these changes, including the names of the previous owners of the plants that have been absorbed. In virtually every instance the information given has been authorized, although changes, especially in officers, may have taken place since this part of the Directory was ordered to be printed.

THE UNITED STATES STEEL CORPORATION.

This Corporation does not operate any iron or steel works, iron-ore mines, coal mines, coke ovens, railroads, or lake vessels.

The United States Steel Corporation; offices, Empire Building, New York. *Executive Committee*: E. H. Gary, Chairman; Daniel G. Reid, Wm. Edenborn, E. C. Converse, Percival Roberts, Jr. and Charles Steele. *Finance Committee*: Robert Bacon, Chairman; Henry H. Rogers, Norman B. Ream, and P. A. B. Widener. *Officers*: Charles M. Schwab, President; James Gayley, First Vice-President; Arthur F. Luke, Treasurer; Richard Trimble, Secretary; and Edward Shearson, Comptroller. *Directors*: J. Pierpont Morgan, John D. Rockefeller, Francis H. Peabody, Henry H. Rogers, Charles M. Schwab, Elbert H. Gary, Robert Bacon, Charles Steele, Marshall Field, Norman B. Ream, P. A. B. Widener, William H. Moore, James H. Reed, Henry C. Frick, Daniel G. Reid, E. C. Converse, Percival Roberts, Jr., John D. Rockefeller, Jr., Alfred Clifford, William E. Dodge, Nathaniel Thayer, William Edenborn, Abram S. Hewitt and Clement A. Griscom.

The United States Steel Corporation was incorporated on February 25, 1901, under the laws of the State of New Jersey. Its authorized capital stock is $1,100,000,000, of which $550,000,000 is 7 per cent. cumulative preferred and $550,000,000 is common. It had issued to July 1, 1901, about $508,000,000 of preferred and $506,000,000 of common stock. In addition it has outstanding $304,000,000 of 5 per cent. collateral trust gold bonds. It owns practically all the stock of

The Carnegie Company,
Federal Steel Company,
National Steel Company,
National Tube Company,
American Steel and Wire Company of New Jersey.
American Tin Plate Company,
American Steel Hoop Company,
The American Sheet Steel Company,
The American Bridge Company, and the
Lake Superior Consolidated Iron Mines.

It also owns a majority of the stock of the Shelby Steel Tube Company and one-sixth of the stock of the Pittsburgh Steamship Company and the Oliver Iron Mining Company.

Complete details concerning the officials of all the companies named above and properties owned by them, and their equipment, products, etc., will be found in the following pages.

THE CARNEGIE COMPANY.

Practically all the stock of The Carnegie Company is now owned by the United States Steel Corporation.

The Carnegie Company; offices, No. 525 Main St., East Orange, New Jersey, and Carnegie Building, Pittsburgh. *Officers*: W. E. Corey, President; W. W. Blackburn, Secretary and Treasurer; James J. Campbell, Assistant Secretary and Auditor; and W. C. McCausland, Assistant Treasurer, all at Pittsburgh. *Board of Directors*: W. E. Corey, Charles M. Schwab, E. H. Gary, W. W. Blackburn, and James B. Dill.

The Carnegie Company was incorporated on March 24, 1900, under the laws of the State of New Jersey. The capital stock issued amounts to $160,000,000, divided into shares of the par value of $1,000 each. The collateral trust five per cent. 100-year bonds issued amount to $160,000,000. The securities of the company are not listed. The entire issue was

one double Uehling pig-iron casting machine. Furnaces Nos. 1 and 2 will be rebuilt in 1901. A. C. Dinkey, General Superintendent; G. K. Hanifeldt, Furnace Superintendent.—*Active in 1901.*

Duquesne Furnaces, at Cochran (post office address, Duquesne), four miles from Pittsburgh, on the Pennsylvania and the Union Railroads and the Monongahela river. Four stacks: Nos. 1, 2, and 3, each 100 x 22, and No. 4, 100 x 21; sixteen Kennedy-Cowper stoves, each 97 x 21. First blasts: No. 1, June 8, 1896; No. 2, October 7, 1896; No. 3, May 7, 1897; and No. 4, June 21, 1897. Fuel, Connellsville coke; ore, Lake Superior; product, Bessemer and basic pig iron; annual capacity, 750,000 gross tons. Equipped with one Uehling pig iron casting machine. [illegible]ay R. Johnson, Superintendent.—*Active in 1901.*

Edgar Thomson Furnaces, at Bessemer (post office address, Braddock), two miles from Pittsburgh, on the Pennsylvania, the Baltimore and Ohio, the Pittsburgh and Lake Erie, the Pittsburgh, Bessemer, and Lake Erie, and the Union Railroads, and the Monongahela river. Nine stacks, four of which were built by the Edgar Thomson Steel Company, Limited, and five by Carnegie Brothers & Co., Limited. Furnace A, 80 x 151/2, has four fire-brick stoves, each 65 x 15, and one fire-brick stove 75 x 18; Furnaces B, 81 x 191/2, and C, 82 x 20, have eight fire-brick stoves, six 75 x 20 and two 75 x 21; Furnaces D, 80 x 20, and E, 90 x 22, have eight fire-brick stoves, four 78 x 21 and four 90 x 21; Furnaces F, 90 x 21, and G, 90 x 22, have seven fire-brick stoves, each 90 x 21; and Furnaces H and I, each 90 x 20, have seven fire-brick stoves, each 90 x 21. First blasts: A, January 3, 1880; B, April 4, 1880; C, November 4, 1880; D, April 18, 1882; E, June 28, 1882; F, October 19, 1886; G, June 21, 1887; H, March 1, 1890; and I, August 17, 1890. Fuel, Connellsville coke; ores, Lake Superior and foreign; product, Bessemer and basic pig iron and spiegeleisen and ferromanganese; annual capacity, 1,100,000 gross tons. Equipped with one Uehling pig-iron casting machine. Thomas Morrison, General Superintendent, and Charles Dinkey, Assistant General Superintendent.—*Active in 1901.*

Lucy Furnaces, at Fifty-first st., Pittsburgh, on the Allegheny Valley Railroad. Built by the Lucy Furnace Company and enlarged by Carnegie, Phipps & Co., Limited. Two stacks, Nos. 1 and 2, each 85 x 20; No. 2 rebuilt in 1898; eight fire-brick stoves, each 75 by 21. First blasts: No. 1, May 18, 1872, and No. 2, September 27, 1877. Fuel, Connellsville coke; ores, Pennsylvania and Lake Superior; product, Bessemer, basic, forge, and foundry pig iron; annual capacity 240,000 gross tons. These furnaces are equipped with one Uehling pig-iron casting machine. James Scott, Superintendent.—*Active in 1901.*

Total annual capacity of the 19 stacks: 2,740,000 gross tons.

ROLLING MILLS AND STEEL WORKS—6.

Duquesne Steel Works, at Cochran (post office address, Duquesne), four miles from Pittsburgh, on the Pennsylvania and the Union Railroads and the Monogahela river. Built in 1886-8 by the Allegheny Bessemer Steel Company and capacity increased in 1891-2 by Carnegie Brothers & Co., Limited. First blow made in Bessemer steel converters in February, 1889, and first steel rolled in March, 1889; two 10-gross-ton Bessemer converters, twelve 50-gross-ton basic open hearth steel furnaces, 36 soaking pits, and 6 trains of rolls (one 16, two 21, one 26, one 38, and one 40-inch); product, billets, blooms, slabs, sheet bars, and splice bars; annual capacity, 600,000 gross tons of Bessemer steel ingots, 400,000 tons of open-hearth steel ingots, and 750,000 tons of finished products. Adding one 10 and one 13-inch merchant bar mill; estimated annual capacity, 120,000 tons. Fuel, natural gas and coal. A. R. Hunt, General Superintendent.

Edgar Thomson Steel Works, at Bessemer, (post office address, Braddock), two miles from Pittsburgh, on the Pennsylvania, The Baltimore and Ohio, the Pittsburgh and Lake Erie, the Pittsburgh, Bessemer, and Lake Erie, and the Union Railroads, and the Monongahela river. Built in 1874-5 by the Edgar Thomson Steel Company, Limited, and enlarged by Carnegie Brothers & Co., Limited, and the Carnegie Steel Company. First blow made in Bessemer Steel converters on

August 26, 1875, and first steel rail rolled on September 1, 1875; four 15-gross-ton Bessemer steel converters, 4 spiegel cupolas, (molten Bessemer pig iron is taken from the Edgar Thomson Furnaces to the metal mixers and thence to the converting mill in ladles), 7 pit furnaces, (32 holes), 7 Siemens heating furnaces, one 3-high 40-inch blooming and two 3-high rail trains (one 23-inch and one 27-inch); equipment for finishing rails at a low temperature, hot saws, and finishing machinery; iron and brass foundries; a forge connected with the works contains one 6-ton hammer and 2 heating furnaces. Product, Bessemer steel rails, billets, sheet bars, and iron and brass castings; annual capacity, 1,000,000 gross tons of steel ingots, 650,000 tons of steel rails, billets, and sheet bars, and 50,000 tons of castings. Fuel, natural gas. Thomas Morrison, General Superintendent, and Charles Dinkey, Assistant General Superintendent.

Homestead Steel Works, at Munhall, one mile from Pittsburgh, on the Pennsylvania, the Pittsburgh and Lake Erie, and the Union Railroads, and the Monongahela river. Bessemer steel department built in 1880-81 by the Pittsburgh Bessemer Steel Company, Limited; rebuilt and enlarged by Carnegie, Phipps & Co., Limited, in 1892; first blow made on March 19, 1881; first steel rail rolled on August 9, 1881. Open-hearth steel department built by Carnegie, Phipps & Co., Limited, and the Carnegie Steel Company, Limited; 7 furnaces completed in October, 1886; 1 in July, 1890; 8 in September, 1890; 4 in September, 1895; 5 in April, 1898; 5 in May, 1898; 5 in June, 1899; 5 in July, 1899; and 4 in December, 1899; four 50-gross-ton furnaces now being added. Two 12-gross-ton Bessemer steel converters, and one 20-gross-ton, nineteen 40-gross-ton, and twenty-four 45-gross-ton basic open-hearth steel furnaces; one 200-gross-ton mixing furnace; one 28 and one 38-inch reversing blooming mill; one 33-inch 3-high and one 40-inch reversing cogging mill; one 32-inch and one 30-inch universal slabbing mill; one 23-inch, one 33-inch, and one 35-inch 3-high train for structural shapes; one 119-inch and one 128-inch 3-high sheared plate mill; one 48-inch and one 42-inch universal plate mill; and one 10-inch guide mill; 91 heating pits and 30 heating furnaces; one beam fitting shop; one steel foundry with an an-

nual capacity of 2,500 gross tons of steel castings; one armor plate plant, consisting of a press shop, with one 2,000-ton and one 10,000-ton forging press and 10 heating furnaces, a carbonizing shop with 8 furnaces, and a machine shop for finishing armor plate. Product, blooms, billets, slabs, structural shapes, structural work, boiler plates, ship plates, tank plates, universal plates, armor plates, and steel castings; annual capacity, 400,000 gross tons of Bessemer steel ingots, 1,500,000 tons of basic open-hearth steel ingots, and 1,300,000 tons of rolled products. Finishing capacity of armor plate department 5,000 gross tons per year. Fuel, coal, coke, and natural gas. A. C. Dinkey, General Superintendent.

Howard Axle Works, at Howard, one-half mile from Pittsburgh, on the Pennsylvania, the Pittsburgh and Lake Erie, and the Union Railroads, and the Monongahela river. Built by the Carnegie Steel Company in 1899-1900; operations commenced in April, 1900; one 24-inch train of rolls with 2 continuous heating furnaces, ten 7,000-pound steam hammers, 3 axle straightening presses, and 51 axle turning lathes; product, car axles; annual capacity, 90,000 gross tons. Fuel, coal. A. C. Dinkey, General Superintendent; William Whigham, Superintendent.

Lower Union Mills, at Twenty-ninth st., Pittsburgh, on the Allegheny Valley Railroad. Built in 1861-2 by Kloman & Phipps and enlarged by Wilson, Walker & Co., Limited, and by Carnegie, Phipps & Co., Limited. Ten heating furnaces, 4 trains of rolls, (one 9, one 12, one 15, and one 78-inch), 11 forge fires, and 12 hammers, (400 to 8,000 pounds), and 4 spring pointing machines; product, sheared plates, forgings, and bar steel; annual capacity, 90,000 gross tons of rolled and 1,200 tons of forged products. Fuel, natural gas, coal, and oil. L. T. Brown, General Superintendent.

Upper Union Mills, at Thirty-third st., Pittsburgh, on the Allegheny Valley Railroad. Built in 1863-4 by the Cyclops Iron Company; enlarged by Carnegie, Kloman & Co., Carnegie Brothers & Co., Limited, and Carnegie, Phipps & Co., Limited. Nineteen heating furnaces and 7 trains of rolls (one 8, one 12, one 18, and one 20-inch, two plate, and one 17-inch); product, structural steel, steel bars, and steel universal plates; annual capacity, 230,000 gross tons, including

15,000 tons of columns, girders, and other fitted structural work. Fuel, natural gas and coal. L. T. Brown, General Superintendent.

Total annual capacity of the 6 rolling mills and steel works: Bessemer steel ingots, 2,000,000 gross tons; open-hearth steel ingots, 1,900,000 tons; Iron and brass castings, 50,000 tons; steel castings, 2,500 tons; finished armor plate, 5,000 tons; all other finished rolled and forged products, including the building merchant bar mill, 3,231,200 tons.

CAR-AXLE WORKS—1.

Howard Axle Works, at Howard. Product, car axles; annual capacity, 90,000 gross tons.

H. C. FRICK COKE COMPANY.

H. C. Frick Coke Company; general offices, Scottdale, Pa.; branch offices, Carnegie Building, Pittsburgh. *Officers*: Thomas Lynch, President; William C. Magee, Vice-President; M. M. Bosworth, Secretary; and Philip Keller, Treasurer. *Board of Directors*: Thomas Lynch, W. W. Blackburn, Thomas Morrison, Daniel M. Clemson, William C. Magee, O. W. Kennedy, and Philip Keller.

The property of the H. C. Frick Coke Company consists of 40,000 acres of coal land, 20,000 acres of surface land, and 11,652 coke ovens, with all the necessary equipment, all located in Westmoreland and Fayette counties, Pennsylvania. Also 2,628 railroad cars. In addition to the production of its own coke ovens the company markets the production of 5,463 ovens belonging to the constitutent companies of The United States Steel Corporation, and also the production of about 1,600 other ovens.

CARNEGIE NATURAL GAS COMPANY.

Carnegie Natural Gas Company; offices, Carnegie Building, Pittsburgh. *Officers*: Daniel M. Clemson, President;

Norwood J. Johnston, Vice-President; W. W. Blackburn, Secretary; H. E. Jeffries, Treasurer; and J. D. DeCoursey, Auditor. *Directors*: Daniel M. Clemson, W. W. Blackburn, James Gayley, George Lauder, and Norwood J. Johnston.

The Carnegie Natural Gas Company has under lease 98,000 acres of gas territory in Allegheny, Washington, Armstrong and Westmoreland counties, Pennsylvania, and in Wetzel and Doddridge counties, West Virginia. The property includes 130 producing gas wells and 300 miles of main and branch pipe lines, supplying about 11,000,000,000 cubic feet of natural gas per annum.

Union Railroad Company.

Union Railroad Company; offices, Carnegie Building, Pittsburgh. *Officers*: James H. Reed, President; D. M. Clemson, Vice-President; George E. McCague, Traffic Manager; R. A. Franks, Secretary and Treasurer; and W. J. Post, Auditor. *Board of Directors*: George E. McCague, William J. Post, Robert A. Franks, James H. Reed, Daniel M. Clemson, W. W. Blackburn, and D. G. Kerr.

This company operates 61.52 miles of track connecting the Monongahela river plants of the Carnegie Steel Company, and 12.61 miles of leased track between Bessemer and North Bessemer, Pa. The equipment consists of 59 locomotives and 120 freight cars.

Pittsburgh and Conneaut Dock Company.

Pittsburgh and Conneaut Dock Company; offices, Carnegie Building, Pittsburgh. *Officers*: J. H. Reed, President; D. G. Kerr, Vice-President; R. A. Franks, Secretary and Treasurer; and W. J. Post, Auditor. *Board of Directors*: James H. Reed, Edwin S. Mills, George E. McCague, Robert A. Franks, W. J. Post, and D. G. Kerr.

This company operates the docks at the lake terminus of the Pittsburgh, Bessemer and Lake Erie Railroad, at Conneaut Harbor, Ohio, having a daily capacity of 25,000 tons of

iron ore and 4,000 tons of coal. The company owns 42.6 per cent. of the capital stock of the Pennsylvania and Lake Erie Dock Company and 25 per cent. of the capital stock of the New York, Pennsylvania and Ohio Dock Company.

Trotter Water Company.

Trotter Water Company; offices, Carnegie Building, Pittsburgh. *Officers*: Thomas Lynch, President; Philip Keller, Treasurer; and M. M. Bosworth, Secretary. *Directors*: Thomas Lynch, O. W. Kennedy, Philip Keller, W. W. Blackburn, and Daniel M. Clemson.

The works of this company are located on the Youghiogheny river, 1½ miles above Connellsville, Pa., and supply water to coke works, railroads, manufacturing establishments, and for public consumption generally, in Dunbar, North Union, and Franklin townships, in Fayette county, Pa. The pumping capacity is 5,000,000 gallons per day.

Youghiogheny Northern Railway Company.

Youghiogheny Northern Railway Company; offices, Carnegie Building, Pittsburgh. *Officers*: Thomas Lynch, President; W. C. Magee, Vice-President; Philip Keller, Treasurer; and M. M. Bosworth, Secretary. *Directors*: Philip Keller, O. W. Kennedy, W. C. Magee, W. W. Blackburn, Thomas Morrison, and Daniel M. Clemson.

The line of the Youghiogheny Northern Railway Company extends from Broad Ford to Summit, Fayette county, Pa., about 2.4 miles. The line is leased and operated by the Pittsburgh, McKeesport, and Youghiogheny Railway Company.

YOUGHIOGHENY WATER COMPANY.

Youghiogheny Water Company; offices, Carnegie Building, Pittsburgh. *Officers*: Thomas Lynch, President; Philip Keller, Treasurer; and M. M. Bosworth, Secretary. *Directors*: Thomas Lynch, O. W. Kennedy, Philip Keller, W. W. Blackburn, and Daniel M. Clemson.

The plant of this company is located at Broad Ford, Fayette county, Pa., and has a daily pumping capacity of 2,000,000 gallons. Water is supplied to coke works, manufacturing establishments, railroads, and for domestic consumption in Upper Tyrone and Connellsville townships, in Fayette county.

MOUNT PLEASANT WATER COMPANY.

Mount Pleasant Water Company; offices, Carnegie Building, Pittsburgh. *Officers*: Thomas Lynch, President; Philip Keller, Treasurer; and M. M. Bosworth, Secretary. *Directors*: Thomas Lynch, O. W. Kennedy, W. W. Blackburn, Philip Keller, and Daniel M. Clemson.

The works of this company are located at Bridgeport, Fayette county, Pa. The pumping capacity is 4,000,000 gallons per day, and the reservoir capacity is 220,000,000 gallons. Water is supplied to the borough of Mount Pleasant in Westmoreland county, Pa., and to coke works, railroads, and manufacturing establishments in East Huntington, Mount Pleasant, and Hempfield townships.

BESSEMER AND LAKE ERIE RAILROAD COMPANY.

Bessemer and Lake Erie Railroad Company, lessee of the road and property of the Pittsburgh Bessemer and Lake Erie Railroad Company; offices, Carnegie Building, Pittsburgh. *Officers*: James H. Reed, President; Daniel M. Clemson, Vice-President; R. A. Franks, Secretary and Treasurer; D. Hum, Jr., Auditor; E. H. Utley, General Freight and Pas-

senger Agent; F. E. House, General Manager; and J. S. Matson, General Superintendent. *Board of Directors*: J. E. Schwab, Thomas Morrison, R. A. Franks, W. W. Blackburn, Edwin S. Mills, Daniel M. Clemson, George E. McCague, D. G. Kerr, and James H. Reed.

This company leases 203.31 miles of track (including 12.9 miles of leased track) between Conneaut Harbor, Ohio, Erie, Pa., and North Bessemer, Pa. The equipment consists of 65 standard gauge locomotives, 39 passenger cars, 4,729 freight cars, and 119 service cars.

OLIVER IRON MINING COMPANY.

Oliver Iron Mining Company; offices, Duluth, Minnesota. *Officers*: Thomas F. Cole, President and General Manager; Nelson P. Hulst, Vice-President and General Mining Engineer; C. D. Fraser, Secretary; George D. Swift, Assistant Treasurer, and W. M. Jeffery, Auditor, Duluth; and Charles E. Scheide, Treasurer, 71 Broadway, New York City. *Directors*: Thomas F. Cole, Nelson P. Hulst, W. J. Olcott, Daniel M. Clemson, and D. G. Kerr.

This company owns all the stock of the Security Land and Exploration Company, 75 per cent. of the stock of the Lake Superior Iron Company, and 75 per cent. of the stock of the Regent Iron Company.

The company also holds in fee or by lease various iron-ore properties in the Vermilion, Mesabi, Gogebic, Marquette, and Menominee Ranges in the Lake Superior region, producing about 25 per cent. of the entire ore yield of that district. The shipments from the mines for the season of 1900 amounted to about 5,000,000 tons.

PITTSBURGH STEAMSHIP COMPANY.

Pittsburgh Steamship Company; Principal office, Duluth, Minnesota; branch office, Cleveland, Ohio. *Officers*: Daniel M. Clemson, President, Carnegie Building, Pittsburgh; A. B. Wolvin, Vice-President and General Manager; George D.

Swift, Assistant Treasurer, and W. M. Jeffery, Auditor, Duluth; James H. Hoyt, Secretary, and Edwin S. Mills, Assistant General Manager, Cleveland; and Charles E. Scheide, Treasurer, 71 Broadway, New York City. *Board of Directors*: Daniel M. Clemson, A. B. Wolvin, Edwin S. Mills, D. G. Kerr, and James H. Hoyt.

In February, 1901, this company owned 11 steamships and 2 barges, with an annual ore-carrying capacity of 1,276,800 gross tons. It now operates all the steamships belonging to the constitutent companies of the United States Steel Corporation. (For further information concerning this company see pages 65-7).

THE PITTSBURGH LIMESTONE COMPANY, LIMITED.

The Pittsburgh Limestone Company, Limited; Offices, New Castle, Pa. *Officers*: George W. Johnson, Chairman; James Gayley, Secretary; and William B. Schiller, Treasurer. *Board of Managers*: D. G. Kerr, James Gayley, W. H. H. Smith, George W. Johnson, and William B. Schiller.

This company operates limestone quarries at Tyrone and Williamsburg, in Blair county, and at Wick, in Butler county, Pa. The daily capacity of the quarries is about 4,500 tons.

PROPERTY AT CONNEAUT, OHIO.

The Carnegie Company has purchased 5,000 acres of land on the southern shore of Lake Erie, at Conneaut, Ohio, for mill sites.

FEDERAL STEEL COMPANY.

Practically all the stock of the Federal Steel Company is now owned by the United States Steel Corporation.

Federal Steel Company; General Offices, Empire Building, New York City. *Officers*: Elbert H. Gary, President; Edward Shearson, Assistant to the President; Richard Trimble, Secretary and Treasurer; and W. J. Filbert, Auditor.

Board of Directors: E. H. Gary, Charles M. Schwab, Robert Bacon, Charles MacVeagh, and James Sim. Capital stock issued, $99,745,200, of which $53,260,900 is 6 per cent, non-cumulative preferred and $46,484,300 is common. The Federal Steel Company has no bonded indebtedness, although the companies whose entire capital stock it owns have bonds outstanding in the hands of the public to the amount of $26,829,000. The Federal Steel Company owns the entire capital stock of the following companies:

THE ILLINOIS STEEL COMPANY.

The Illinois Steel Company; general offices, Rookery Building, Chicago. *Officers*: E. J. Buffington, President; C. H. Foote, First Vice-President; T. J. Hyman, Secretary and Treasurer; T. W. Robinson, General Manager; L. D. Doty, Purchasing Agent; George Baker, General Manager of Sales; F. H. Foote, Manager Blast Furnaces; and E. M. Hagar, Manager of Cement Department. *Officers at the Works:* North Works—W. H. Pratt, General Superintendent, and P. J. Grogan, Auditor; South Works—C. H. McCullough, Jr., General Superintendent, and J. F. Wilson, Auditor; Joliet Works—S. B. Sheldon, Acting Superintendent, and H. Morrison, Auditor; Milwaukee Works—George L. Reis, General Superintendent, and L. W. McNamee, Auditor. *Sales Department*: Chicago—George Baker, General Manager of Sales. New York—Charles W. Baker, Manager, and C. C. Cluff, Assistant Manager, Empire Building. Philadelphia—J. Ogden Hoffman, Manager, and James B. Bonner, Assistant Manager, Harrison Building. Buffalo—T. Guilford Smith, Manager, German Insurance Building. Cleveland—James R. Mills, Jr., Manager, Perry-Payne Building. Cincinnati—W. H. D. Totten, Jr., Manager, Union Trust Building. Atlanta, Ga.—Walter M. Kelley, Manager, Equitable Building. Detroit—N. D. Carpenter, Manager, Union Trust Building. St. Paul—George A. McDougall, Manager, Pioneer Press Building. St. Louis—W. J. Totten, Manager, Chemical Building. Denver—Edward M. Sparhawk, Manager, People's Bank Building. San Francisco—William B. Isaacs, Manager, 258 Market St. Montreal, Canada—Charles Cassils, Manager, Bell Telephone Building. Mexico—W. B. Weston, Manager,

924 Apartado. St. Louis—B. F. Affleck, South Western Agent Cement Department, 324 Odd Fellows' Building. Havana, Cuba—Howard Egleston, Cuban Agent Cement Department, 36 Obispo st. *Board of Directors*: Charles M. Schwab, E. H. Gary, E. J. Buffington, C. H. Foote, E. Shearson, E. C. Converse, Percival Roberts, Jr., T. W. Robinson, W. L. Brown, K. K. Knapp, and T. J. Hyman. *Executive Committee:* E. J. Buffington, E. H. Gary, Charles M. Schwab, C. H. Foote, and T. J. Hyman. The Illinois Steel Company operates the following works:

BLAST FURNACES—18 COMPLETED AND 1 BUILDING.

Joliet Works, Joliet, Will county, Illinois. Three stacks, each 80 x 20; Nos. 1 and 2, built in 1873 and rebuilt in 1891, and No. 3, built in 1889-90; four Siemens-Cowper-Foote, four Massicks & Crooke, and four Whitwell-Gordon stoves; fuel, Connellsville and Pocahontas Flat-Top coke; ores, Lake Superior and Northern ranges; product, Bessemer pig iron; total annual capacity, 330,000 gross tons. Equipped with one Heyl & Patterson pig-iron casting machine. O. O. Landig, Furnace Superintendent. Selling agents, Pickands, Brown & Co., Chicago.—*Active in 1901.*

Milwaukee Works: Bay View Furnaces, Milwaukee, Milwaukee county, Wisconsin. Two stacks, Nos. 1 and 2, each 66 x 16, built in 1870-1; six Massicks & Crooke stoves; fuel, coke; ores, Lake Superior, Gogebic, and Iron Ridge; product, basic, malleable Bessemer, forge, and foundry pig iron; total annual capacity, 135,000 gross tons. Brands, "Bay View, Nos. 1, 2, and 3," "Gertrude," and "Milwaukee Scotch." John McDonald, Acting Furnace Superintendent. Selling agents, Pickands, Brown & Co., Chicago.—*Active in 1901.*

North Works, Chicago, Cook county, Illinois. Furnaces at the foot of Wabansia avenue, on the north branch of the Chicago river. Two stacks, Nos. 1 and 2, each 66 x 16, built in 1869; engine and boiler equipment sufficient to operate only one furnace at a time; four fire-brick stoves of various types; fuel, Connellsville and Pocahontas coke; ores, Lake Superior, Gogebic, Western, and foreign; product, chiefly spiegeleisen and basic open-hearth and foundry pig iron; total annual capacity, 60,000 gross tons. C. Dann, Furnace Superintend-

ent. Selling agents, Pickands, Brown & Co., Chicago.—*Active in 1901.*

South Works, South Chicago, Cook County, Illinois. Nine completed stacks and one stack building. Completed stacks, Nos. 1, 2, 3, and 4, each 75 x 19, built in 1880-1; sixteen Siemens-Cowper-Foote stoves. Nos. 5, 6, 7, and 8, each 85 x 20, built in 1890-1; sixteen Massicks & Crooke stoves. No. 9, 95 x 22, built in 1900-1901, and blown in July 3, 1901; four 4-pass hot blast stoves. Fuel, Connellsville and Pocahontas coke; ores, Lake Superior and Northern ranges; product, Bessemer pig iron; total annual capacity, 1,050,000 gross tons. The furnace now being erected will be known as No. 10, and will be 95 x 22 feet; it will have four 4-pass hot-blast stoves, 100 x 25 feet, an annual capacity of 140,000 tons, and is expected to be ready for blast in October. Equipped with four Heyl & Patterson pig-iron casting machines. Barney Marron, Assistant Furnace Superintendent. Selling agents, Pickands, Brown & Co., Chicago.—*Active in 1901.*

Union Works, Chicago, Cook county, Illinois. Furnaces at Ashland ave. and Thirty-first st., on the south branch of the Chicago river. Two stacks, Nos. 3 and 4, each 73 x 15 1-3, built in 1881 and rebuilt in 1889; seven Siemens-Cowper-Foote stoves; fuel, Connellsville and Pocahontas Flat-Top coke; ores, Lake Superior, Gogebic, and Minnesota for Bessemer pig iron, and foreign, Southern, and Western for spiegeleisen and ferromanganese; product, spiegeleisen, ferromanganese, and Bessemer pig iron; total annual capacity, 140,000 gross tons. T. N. Conlin, Furnace Superintendent. Selling agents, Pickands, Brown & Co., Chicago.—*Active in 1901.*

Total annual capacity of the 18 completed furnaces: 1,715,000 gross tons; of the building furnace, 140,000 tons.

ROLLING MILLS AND STEEL WORKS—4.

South Works, South Chicago, Cook county, Illinois. Three 12-gross-ton Bessemer steel converters, twelve 10-ingot soaking pits, and one 3-high 40-inch blooming and one 3-high 27-inch finishing train, with 4 stands of rolls; first blow made June 14, 1882; product, Bessemer steel ingots, rails, and billets; annual capacity, 835,000 gross tons of ingots and 675,000 tons of rails and billets. Open-hearth steel de-

partment added in 1894-5; first steel made February 11, 1895; one acid and nine basic furnaces (one 35-gross-ton Siemens acid furnace, four 50-gross-ton basic Wellman rolling, and five 30-gross-ton basic Siemens furnaces); one plate train, with 2 stands of rolls, 34 x 90 and 34 x 132 inches, and 4 gas heating furnaces; product, fire-box, boiler, ship, and tank plate; annual capacity, 240,000 gross tons of open-hearth ingots and 110,000 tons of plates. Slabbing mill added in 1898-9; first put in operation March 16, 1899; one 40-inch mill with rolls 84 inches long to roll slabs, billets, and blooms from 4 x 4 inches up to 24 x 24 inches; annual capacity, 240,000 gross tons of slabs, blooms and billets. Fuel, coal for steam and manufactured gas, natural gas, and fuel oil for heating purposes. Total annual capacity: ingots, 1,075,000 gross tons; rolled products, 1,025,000 tons. C. H. McCullough, Jr., Superintendent.

Joliet Works, Joliet, Will county, Illinois. Built in 1870; two 10-gross-ton Bessemer steel converters; first blow made January 26, 1873, and first steel rail rolled March 15, 1873; annual capacity, 600,000 gross tons of Bessemer steel ingots. Steel rail mill has 7 heating furnaces, one 36-inch blooming train, one 23-inch rail train, and one Sellers 3-ton hammer; annual capacity, 540,000 gross tons of rails or billets. Wire-rod mill contains one Garrett mill built in 1888 and another added in 1895; 4 heating furnaces; annual capacity, 210,000 gross tons. A third wire-rod mill, arranged to roll either rods, hoops, or cotton-ties, added in 1898; annual capacity, 50,000 gross tons of wire rods or 30,000 gross tons of cotton-ties and hoops. Merchant mill, built in 1895, contains machinery for the production of merchant steel and railroad supplies, including spikes, bolts, nuts, washers, etc.; annual capacity of merchant mill, 40,000 gross tons of merchant products; of factory products, 30,000 tons. Fuel, coal for steam, manufactured gas in the principal departments, and some fuel oil for heating purposes. Total annual capacity: ingots, 600,000 gross tons; rolled products, 840,000 tons; forged products, 30,000 tons. S. B. Sheldon, Acting Superintendent.

Milwaukee Works, Milwaukee, Milwaukee county, Wisconsin. Built in 1868 and 1874; remodeled in 1895-6; 11 heating furnaces, using gas as fuel, and 6 trains of rolls (one 8, two 9, one 12, one 21, and one 22-inch); product, light rails,

(12 to 45 pounds per yard,) merchant bar steel, and angle and splice bars; annual capacity, 150,000 gross tons of light rails and steel bars and 30,000 tons of angle and splice bars. Fuel, coal and manufactured gas. George L. Reis, Superintendent.

North Works, Chicago, Cook county, Illinois. Rolling mill and steel departments dismantled.

Union Works, 3179 Ashland ave., Chicago, Cook county, Illinois. Original mill built in 1863 and original Bessemer steel works made first blow on July 26, 1871; Bessemer steel works and rail mill rebuilt in 1885-6; two 10-gross-ton converters, 5 cupolas, 4 spiegel cupolas, one 3-high 35-inch blooming mill, one gas bloom and 4 gas ingot heating furnaces, and one 3-high 25-inch rail train; product, Bessemer steel rails and billets; annual capacity, 325,000 gross tons of ingots and 270,000 tons of rails or billets. Fuel, oil. (The equipment described above is idle and partly dismantled and is not likely to be again operated.)

Total annual capacity of the 4 rolling mills and steel works: Bessemer steel ingots, 1,760,000 gross tons; open-hearth steel ingots, 240,000 tons; all kinds of rolled and forged products, 2,345,000 tons.

BRIDGE AND STRUCTURAL PLANT—1.

North Works, North Chicago, Illinois. Railroad and highway bridges; also erect iron and steel buildings; annual capacity, 15,000 gross tons. (Formerly operated by the Universal Construction Company.)

CEMENT PLANTS—2.

North Works, North Chicago, Illinois. Built in 1895; product, hydraulic "steel" cement (Puzzolan) of high quality, manufactured from blast furnace slag; daily capacity, 500 barrels.

South Works, South Chicago, Illinois. Built in 1899-1900; product, "Steel" and "Universal Portland" cement; daily capacity, 1,500 barrels. The "Universal Portland" cement is of the highest quality, is a true Portland, and equals in every way the best foreign and American brands of Portland cement.

WIRE ROD MILL—1.

Joliet Works, Joliet, Ill. Product, wire rods. Annual capacity, 260,000 gross tons.

BOLT, NUT, AND RIVET WORKS—1

Joliet Works, Joliet, Illinois. Product, steel bolts, nuts, and rivets. Sizes: bolts, from ½ of an inch to 1 inch; nuts, from ½ of an inch to 1 inch; rivets, from ½ of an inch to 1¼ inches. Annual capacity, 5,000 gross tons.

SPIKE WORKS—1.

Joliet Works, Joliet, Illinois. Product, standard steel spikes; sizes, 5½ inches by 9/16 of an inch; annual capacity, 30,000 gross tons.

RAILROADS, IRON-ORE MINES, COAL LANDS, COKE OVENS, AND LIMESTONE QUARRIES.

The Illinois Steel Company owns the entire capital stock of the Chicago, Lake Shore, and Eastern Railroad Company, which operates over 299 miles of track by ownership, lease, or otherwise. It also owns the Cundy Iron Ore Mine, at Quinnesec, Michigan, the Iron Ridge Mine, at Iron Range, Dodge County, Wisconsin, and 4,015 acres of ore lands in Marquette, Dickinson, Iron and Baraga counties, Michigan, on which is located the Youngstown Mine, near Crystal Falls; also 5,908 acres of mineral lands in Iron and Gogebic counties, Michigan. It also owns 5,986 acres of unmined coking coal lands, of which 1,471 acres are located in Westmoreland county, Pa., and are in the name of the Southwest Connellsville Coke Company; on these lands there is a plant of 1,233 bee-hive coke ovens. The remaining 4,400 acres are located in Raleigh county, W. Va. This last-named tract has no mines in operation at present. The company also operates limestone quarries near Logansport, Ind., containing in all 400 acres.

THE LORAIN STEEL COMPANY.

The Lorain Steel Company; general offices, Lorain, Ohio. *Officers:* Daniel Coolidge, President; Max M. Suppes, Vice-President and General Manager; P. M. Boyd, Secretary; A. C. Gary, Treasurer; and Joseph H. Craig, Auditor. *Sales Agents:* H. C. Evans, Battery Park Building, New York City; A. S. Littlefield, Monadnock Building, Chicago, Illinois, and Bank of Commerce Building, St. Louis, Missouri; S. P. S. Ellis, Penn Building, Pittsburgh, Pa.; William W. Kingston, Equitable Building, Atlanta, Georgia; and Millard Hunsiker, 29 Great St. Helens, London, E. C., England. *Board of Directors:* Charles M. Schwab, Elbert H. Gary, E. C. Converse, and E. Shearson, of New York City; Daniel Coolidge, Max M. Suppes, P. M. Boyd, A. C. Gary, and Joseph H. Craig, of Lorain, Ohio. The Lorain Steel Company operates the following works:

BLAST FURNACES—2.

Lorain Furnaces, Lorain, Lorain county, Ohio. Two stacks, each 100 x 22; No. 1 built in 1898-9 and blown in July 5, 1899; No. 2, built in 1898-9 and blown in August 23, 1899; eight Cowper-Roberts fire-brick stoves, 100 x 21; fuel, Connellsville coke; ores, Lake Superior and Mesabi; product, Bessemer pig iron; total annual capacity, 400,000 gross tons. Brand, "Lorain." Equipped with one pig-iron casting machine. S. W. Vaughen, Furnace Superintendent.—*Active in 1901.*

Total annual capacity of the 2 furnaces, 400,000 gross tons.

ROLLING MILLS AND STEEL WORKS—2.

Lorain Works, Lorain, Lorain county, Ohio. Built in 1894-5, using rail mill machinery from the company's works at Johnstown, Pennsylvania; two 38-inch reversible blooming mills, one of which was built in 1899; one 27-inch girder rail mill, with an engine at each end, making practically a double mill; 4 gas heating furnaces; product, blooms, billets, slabs, girder and T rails, and street railroad specialties; annual capacity, 500,000 gross tons. Bessemer steel department contains two 12-gross-ton acid converters; first steel made April 1, 1895; 28 soaking pits; product, Bessemer steel ingots; an-

nual capacity, 550,000 gross tons. Fuel, coal and producer gas. Brand, "Lorain." W. Y. Williams, Superintendent Bessemer Department, and H. C. Ryding, Superintendent rail mill. (Formerly operated by The Johnson Company.)

Johnson Works, Johnstown, Cambria county, Pa. Principal office, Lorain, Ohio. Original works built in 1887-8 and put in operation May 13, 1888; open-hearth steel department started in 1889; one 2-gross-ton acid open-hearth furnace, using oil gas, and one 7-gross-ton acid open-hearth furnace, using producer gas; annual capacity, 6,500 gross tons of street railroad specialties. Switch and drop-forging works, an electric welding plant, and an iron foundry for making rolls and general castings are connected with the works. Fuel, coal and oil. P. Lavelle, General Manager. (Formerly operated by The Johnson Company.)

Total annual capacity of the 2 rolling mills and steel works: Bessemer steel ingots, 550,000 gross tons; rolled products and street railroad specialties, 506,500 tons.

Minnesota Iron Company.

The Minnesota Iron Company owns 150,300 acres of iron-ore mining lands in Minnesota and Michigan. It has seven mines, of which five are in operation, namely, Minnesota and Chandler in the Vermilion Range, and Fayal, Auburn, and Genoa, in the Mesabi Range, producing over 3,000,000 gross tons of iron ore annually. It also owns the entire capital stock and $3,500,000 of the second mortgage bonds of the Duluth and Iron Range Railroad Company, which has 192 miles of track and valuable ore docks on the Lake Superior. It also owns the entire capital stock and bonds of the Minnesota Steamship Company, which has 12 steamers and 10 barges, with an annual aggregate ore-carrying capacity of 2,052,000 gross tons. It also owns eleven-twentieths of the capital stock of the Minnesota Dock Company, which operates docks on Lake Erie. *Office:* Duluth, Minnesota. *Officers:* Thomas F. Cole, President and General Manager, Nelson P. Hulst, Vice-President and General Mining Engineer, C. D. Fraser, Secretary, and George D. Swift, Assistant Treasurer, Duluth, Minn.; and Charles E. Scheide, Treasurer, and Thomas Mur-

ray, Assistant Treasurer, 71 Broadway, New York. *Board of Directors:* E. H. Gary, E. C. Converse, Percival Roberts, Jr., Charles M. Schwab, Charles P. Coffin, A. H. Viele, W. J. Olcott, Nelson P. Hulst, and Thomas F. Cole.

THE ELGIN, JOLIET, AND EASTERN RAILROAD COMPANY.

The Elgin, Joliet, and Eastern Railroad Company operates 190 miles of main line and branches and 114 miles of spurs and yards, making a total of 304 miles. The company owns 56 locomotives, 2,032 freight cars, and 3 passenger cars.

NEW COKING COAL LANDS.

The Federal Steel Company has acquired 5,296 acres of coking coal lands and 1,344 acres of surface land in Fayette county, Pa., on which three plants of 400 coke ovens each have been erected, in all 1,200 ovens. A new line of railroad, known as the Masontown and New Salem Railroad, about twelve miles long, has been constructed by a company of that name, connecting all of the coking plants on the above property. The Baltimore and Ohio Railroad Company and the Pennsylvania Railroad Company have extended their lines of railroad to connect with the Masontown and New Salem Railroad.

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NATIONAL STEEL COMPANY.

Practically all the stock of the National Steel Company is now owned by The United States Steel Corporation.

National Steel Company; general offices, Carnegie Building, Pittsburgh, Pa. *Officers:* W. E. Corey, President, H. P. Bope, First Vice-President and General Manager of Sales; W. W. Blackburn, Second Vice-President and Secretary; W. C. McCausland, Treasurer; James J. Campbell, Assistant Secretary and Auditor; and William R. Conrad, Assistant Treasurer. *Sales Agencies:* Equitable Building, Atlanta,

Georgia; No. 125 Milk st., Boston, Massachusetts; No. 451 Main st., Buffalo, New York; Rookery Building, Chicago, Illinois; No. 104 West Fourth street, Cincinnati, Ohio; No. 103 Superior street, Cleveland, Ohio; People's Bank Building, Denver, Colorado; Union Trust Building, Detroit, Michigan; Guaranty Building, Minneapolis, Minn.; Empire Building, New York City; Harrison Building, Philadelphia; No. 721 Olive st., St. Louis, Missouri; and No. 258 Market st., San Francisco, California. *Foreign:* Bell Telephone Building, Montreal, Canada; Apartado No. 924, City of Mexico, Mexico; and Nos. 71-72 King William st., London, England. Capital stock issued, $27,000,000 of 7 per cent. cumulative preferred and $32,000,000 of common. Bonded indebtedness assumed, $3,819,000. The company operates the following works:

BLAST FURNACES—18.

Bellaire Works, Bellaire, Belmont county, Ohio. Two stacks: one, 75 x 17, built in 1873, blown in September 22, 1873, and rebuilt in 1886; and one, 75 x 18, built in 1894-5 and blown in March 7, 1895; eight Massicks & Crooke stoves; fuel, Connellsville coke; ore, Lake Superior; product, Bessemer pig iron; total annual capacity, 220,000 gross tons. Equipped with one pig-iron casting machine. (Formerly called the Bellaire Furnaces and operated by the Bellaire Steel Company.) —*Active in 1901.*

Columbus Works, Columbus, Franklin county, Ohio. Two stacks; one, 75 x 17½, completed in November, 1873, and rebuilt in 1892, 1895, and 1900, has three Massicks & Crooke stoves, each 65 x 18 (formerly called Franklin Furnace); the other, 80 x 18, built in 1897 and first blown in August 12, 1897, has three Massicks & Crooke stoves, each 75 x 19½ (formerly called Steelton Furnace). Fuel, Pocahontas and New River coke; ore, Lake Superior; product, Bessemer pig iron; total annual capacity, 190,000 gross tons. (Formerly operated by The King, Gilbert, and Warner Company.)—*Active in 1901.*

Mingo Works, Mingo Junction, Jefferson county, Ohio. Three stacks: No. 1 Furnace (formerly known as No. 2), 75 x 17, built in 1872 and rebuilt in 1886; four Gordon-Whitwell-Cowper stoves. No. 2 Furnace, 106½ x 23, built in 1900-1901

and blown in in June, 1901; four Massicks & Crooke stoves, each 85 x 21. No. 3 Furnace, 106½ x 23, built in 1900-1901 and first blown in April 28, 1901; four Massicks & Crooke stoves, each 85 x 21. Fuel, Connellsville coke; ore, Lake Superior; product, Bessemer pig iron; total annual capacity, 500,000 gross tons. Equipped with one pig-iron casting machine. (Old No. 1 Furnace, 75 x 17, built in 1871 and rebuilt in 1886, dismantled in 1900.) (Formerly called the Mingo Furnaces and operated by the Aetna-Standard Iron and Steel Company.)—*Active in 1901.*

New Castle Works, New Castle, Lawrence county, Pennsylvania. Four stacks: No. 1 Furnace, (formerly called Rosena and operated by the Oliver and Snyder Steel Company,) one stack, 100 x 20, built in 1872, first put in blast in June, 1873, and rebuilt in 1893; old furnace torn down in 1897 and rebuilt and blown in in the same year; five Massicks & Crooke stoves, four 75 x 20 and one 85 x 21. No. 2 Furnace, (formerly called Neshannock and operated by the Shenango Valley Steel Company,) one stack, 75 x 18½, built in 1872; first put in operation December 1, 1872; remodeled in 1883; four Whitwell stoves, three 60 x 18 and one 65 x 20, and one improved Massicks & Crooke stove, 70 x 20. No. 3 Furnace, (formerly called Shenango and operated by the Shenango Valley Steel Company,) one stack, 75 x 18½; built and blown in in 1872; rebuilt in 1885; four Cowper-Kennedy stoves, three 65 x 18 and one 75 x 20. No. 4 Furnace, (new,) 106½ x 23, built in 1900-1901 and first put in blast in July, 1901; four Massicks & Crooke stoves, each 85 x 21; equipped with a slag casting machine. Fuel, coke; ore, Lake Superior; product, Bessemer pig iron; total annual capacity, 580,000 gross tons. Equipped with pig-iron casting machines. (One of the old Shenango Furnaces, 80 x 17¾, and built in 1872, was dismantled in 1900.)—*Active in 1901.*

Niles Works, Niles, Trumbull county, Ohio. One stack, 76 x 18½; original stack built in 1870, and enlarged in 1883, and torn down and rebuilt in 1890; entirely new equipment; four Massicks & Crooke stoves; fuel, Connellsville coke; ore, Lake Superior; product, Bessemer pig iron; annual capacity, 90,000 gross tons. (Formerly called the Thomas Furnace and operated by The Thomas Furnace Company.)—*Active in 1901.*

Ohio Works, Youngstown, Mahoning county, Ohio. Three stacks, each 106½ x 23: No. 1 built in 1899-1900 and blown in February 15, 1900, has four Cowper-Kennedy-Roberts stoves, each 110 x 21; No. 2, built in 1899-1900 and blown in June 7, 1900, has four Cowper-Kennedy-Roberts stoves, each 110 x 21; and No. 3, built in 1900-1901 and blown in March 29, 1901, has four Massicks & Crooke stoves, each 85 x 21. Fuel, Connellsville coke; ore, Lake Superior; product, Bessemer pig iron; total annual capacity, 600,000 gross tons. Equipped with two pig-iron casting machines. (Partly built by The Ohio Steel Company and completed by the National Steel Company.)—*Active in 1901.*

Sharon Works, Sharon, Mercer county, Pa. Two alternate stacks, each 75 x 18, one built in 1865 and rebuilt in 1887 and one built in 1866 and enlarged in 1883; one Kennedy and three Whitwell stoves; fuel, coke; ore, Lake Superior; specialty, basic open-hearth pig iron; total annual capacity, 80,000 gross tons. One furnace may be dismantled in 1901. (Formerly operated by the Sharon Iron Company, Limited.)—*Active in 1901.*

Zanesville Works, Zanesville, Muskingum county, Ohio. One stack, 75 x 16, built in 1870-1, blown in September 7, 1871, and rebuilt in 1883; three Whitwell stoves, each 65 x 17, and one Kennedy stove, 70 x 18; fuel, Connellsville coke; ore, Lake Superior; product, Besemer pig iron; annual capacity, 65,000 gross tons. (Formerly called the Zanesville Furnace and operated by the Ohio Iron Company.)—*Active in 1901.*

Total annual capacity of the 18 furnaces: 2,325,000 gross tons.

ROLLING MILLS AND STEEL WORKS—6.

Bellaire Works, Bellaire, Belmont county, Ohio. Rolling mill built in 1867 and put in operation in February, 1868; remodeled in 1893 and rebuilt in 1895; 3 trains of 24-inch rolls, with five driven roller and chain transfer tables. Bessemer steel works, built in 1883-4 and rebuilt in 1897; two 10-gross-ton converters, 3 soaking pits, and one 32-inch blooming mill; first blow made April 28, 1884; annual capacity, 300,000 gross tons of ingots. Product, soft steel blooms, billets, slabs, and sheet and tinplate bars; annual capacity, 250,000 gross tons.

Fuel, coal and producer gas. (Formerly operated by the Bellaire Steel Company.)

Columbus Works, Columbus, Franklin county, Ohio. Built in 1894-5 and put in operation May 2, 1895; two 4½-gross-ton Bessemer steel converters with an annual capacity of 200,000 gross tons, 2 soaking pits, 2 heating furnaces, and 3 trains of rolls (one 32-inch reversing blooming, one 20-inch sheet bar, and one 24-inch small billet); product, steel slabs, billets, and sheet bars; annual capacity, 150,000 gross tons. Fuel, coal and producer gas. (Formerly operated by The King, Gilbert, and Warner Company.)

Mingo Works, Mingo Junction, Jefferson county, Ohio. Built in 1885-6; two 10-gross-ton Bessemer steel converters with an annual capacity of 450,000 gross tons of ingots; first blow made February 8, 1886; two 6-hole soaking pits, one 34-inch direct-coupled blooming mill, and one Kennedy continuous mill; product, blooms, billets, slabs, and sheet and tinplate bars; annual capacity, 400,000 gross tons. Fuel, coal and producer gas. Pig iron is taken by direct metal process from the Mingo Furnaces to the Bessemer converters. (The Mingo Works were formerly called the Junction Works and were operated by the Laughlin and Junction Steel Company. They were consolidated with the works of the Aetna-Standard Iron and Steel Company on July 1, 1897, and were operated by that company until acquired by the National Steel Company.)

New Castle Works, New Castle, Lawrence county, Pa. Two 8-gross-ton Bessemer steel converters built in 1892 and first blow made November 2, 1892; annual capacity, 500,000 gross tons of ingots; one 36-inch blooming mill and four 4-hole soaking pits; one bar mill containing 12 trains of rolls driven by four engines; product, steel billets and 8-inch tinplate and sheet bars; annual capacity, 450,000 gross tons. Fuel, coal and producer gas. Pig iron is taken by direct metal process from the New Castle Furnaces to the Bessemer converters. The Bessemer converters will be increased in 1901 to 10 gross tons, the ingot capacity to 600,000 gross tons, and the rolled capacity to 550,000 tons. (Formerly called the Shenango Valley Steel Works and operated by the Shenango Valley Steel Company.)

Ohio Works, Youngstown, Mahoning county, Ohio. Built in 1893-4; two 10-gross-ton acid Bessemer steel converters; first steel made February 4, 1895; six 4-hole soaking pits, 5 trains of rolls, (one 34-inch blooming, three 24-inch roughing and finishing, and one 14-inch Morgan continuous,) and one 1,500-lb. hammer; first steel rail rolled May 14, 1900; product, sheet and tinplate bars, slabs, billets to 1½ inches square, and T rails; annual capacity, 650,000 gross tons of ingots or 600,000 tons of rolled or forged products. Fuel, coal and producer gas. Pig iron taken by direct metal process from furnaces to Bessemer converters. (Formerly operated by The Ohio Steel Company.)

Sharon Works, Sharon, Mercer county, Pa. Built in 1896-7 and first put in operation in May, 1897; six 30-gross-ton basic open-hearth steel furnaces; first steel made May 24, 1897; annual capacity, 110,000 gross tons of basic open-hearth ingots; three 4-hole soaking pits, one 35-inch blooming mill, and one 3-high 27-inch finishing mill having connected with it a 24-inch bullhead mill; product, blooms, slabs, sheet and tinplate bars, and small billets; annual capacity, 150,000 gross tons. Fuel, coal and producer gas. (Formerly operated by the Buhl Steel Company.)

Total annual capacity of the 6 rolling mills and steel works: Bessemer steel ingots, 2,100,000 gross tons; open-hearth steel ingots, 110,000 tons; rolled and forged products, 2,000,000 tons.

IRON-ORE MINES, COAL LANDS, COKE OVENS, AND LAKE VESSELS.

The National Steel Company owns all the stock of the Winthrop Iron Company and the Chapin Mining Company. It also owns one-fourth of the Biwabik Mine in the Mesabi Range of the Lake Superior iron-ore region.

The company owns the capital stock of the Continental Coke Company, which owns the Revere tract of 1,250 acres of coking coal land, with 600 coke ovens, and the Thompson tract of 717 acres of coking coal land, with 400 coke ovens, near Uniontown, Pa., all in the Connellsville region. It also owns a one-third interest in about 7,000 acres of steam coal lands in the Panhandle region of the Pittsburgh District in Pennsylvania. The company also owns the capital stock of

the Standard Connellsville Coke Company, which formerly operated 400 coke ovens at Pleasant Unity, Pennsylvania, but are now operated by the Continental Coke Company.

It also owns the capital stock of the Mutual Transportation Company, and the Menominee Transit Company, operating a fleet of 9 ore vessels on the Great Lakes, with an aggregate annual ore-carrying capacity of 564,300 gross tons of iron ore.

NATIONAL TUBE COMPANY.

Practically all the stock of the National Tube Company is now owned by the United States Steel Corporation.

National Tube Company; general offices, Conestoga Building, Pittsburgh; New York office, Havemeyer Building. *Officers at Pittsburgh:* F. J. Hearne, President, in charge of all the affairs of the company; William B. Schiller, First Vice-President, in charge of manufacturing; William H. Latshaw, Second Vice-President, in charge of mercantile affairs; John D. Culbertson, Third Vice-President, Treasurer, and Secretary, in charge of financial affairs; Taylor Allderdice, Assistant to First Vice-President; Peter Boyd, General Superintendent; Peter Patterson, Consulting Engineer; P. C. Patterson, Mechanical Engineer; J. F. Townsend, Traffic Manager; Edward Worcester, General Sales Agent; George S. Garritt, Assistant General Sales Agent; C. I. O'Connor, General Purchasing Agent; and A. T. Stewart, Auditor. *Officers at New York:* A. S. Matheson, Fourth Vice-President, in charge of foreign affairs, Havemeyer Building; and Sullivan & Cromwell, General Counsel, 45 Wall street. *Managers of Departments:* Allison, Chester, and Morris-Tasker Departments, H. Cheston Vansant, 267 South Fourth street, Philadelphia, Pennsylvania; American Department, James H. Matheson, Middletown, Pa.; Cohoes Department, Henry Aird and John Don, Troy, New York; Continental Department, H. R. Gilbert, Pittsburgh, Pa.; National Department, G. G. Crawford, McKeesport, Pa.; Oil City Department, D. J. Geary, Oil City, Pa.; Pennsylvania and Pittsburgh Depart-

ments, William B. Rhodes, Pittsburgh, Pa.; Riverside Department, E. L. Wiles, Manager, and F. H. Crockard, Assistant Manager, Wheeling, West Virginia; Seamless Department, R. C. Stiefel, Manager, Ellwood City, Pa., and J. H. Nicholson, Assistant Manager, Pittsburgh, Pa.; Syracuse Department, George Timmins, Syracuse, New York; and Warren and Youngstown Departments, W. L. Kauffman, Youngstown, Ohio. *Sales Agents:* New York City, Clifton Wharton, Jr., domestic sales agent, and D. B. McClelland, foreign sales agent, Havemeyer Building; Philadelphia, H. Cheston Vansant, 267 South Fourth Street; Pittsburgh, A. M. Lally, Conestoga Building; Chicago, H. S. Raymond, Western Union Building; Boston, P. W. French, 95 Milk street; San Francisco, Charles M. Woods, Pacific Coast sales agent, 420 California st.; St. Louis, E. A. Downey, Security Building; Europe, J. W. Downer, 18 Billiter street, London, E. C., England. *Board of Directors:* E. C. Converse, William Nelson Cromwell, John D. Culbertson, F. J. Hearne, William H. Latshaw, A. S. Matheson, William J. Curtis, William B. Schiller, Charles Steele, C. M. Schwab, and E. H. Gary. Capital stock, $80,000,000, of which $40,000,000 is 7 per cent. cumulative and $40,000,000 is common. The company operates the following works:

BLAST FURNACES—4 COMPLETED AND 1 BUILDING.

Monongahela Furnaces, (National Department,) McKeesport, Allegheny county, Pa. Two stacks, built in 1889-90: Furnace A, 90 x 20, blown in December 1, 1890, and rebuilt in 1900; Furnace B, 90 x 20, blown in June 1, 1891, and rebuilt in 1901; seven Cowper-Kennedy stoves, each 79½ x 21; fuel, Connellsville coke; ore, Lake Superior; product, Bessemer pig iron; total annual capacity, 275,000 gross tons. W. A. Cornelius, Furnace Superintendent. (Formerly operated by the National Tube Works Company.)—*Active in 1901.*

Riverside Furnace, (Riverside Department,) Benwood, Marshall county, West Virginia. One stack, 75 x 17, built in 1871-2 and first blown in February 14, 1872; remodeled in 1876 and entirely rebuilt in 1889; four Massicks & Crooke stoves; fuel, by-product coke, made from Connellsville coal; ore, Lake Superior; product, Bessemer pig iron; annual ca-

pacity, 80,000 gross tons. J. C. Percy, Furnace Superintendent. (A new furnace, to be 100 x 21, is being erected by the Tube Steel Company, a corporation controlled by the National Tube Company. It will make Bessemer pig iron, will have an annual capacity of about 175,000 gross tons, and will be ready for blast early in 1902.) (Formerly operated by the Riverside Iron Works.)—*Active in 1901.*

Steubenville Furnace, (Riverside Department,) Steubenville, Jefferson county, Ohio. One stack, 75 x 16, built in 1872 and rebuilt in 1886; three Massicks & Crooke stoves; fuel, by-product coke, made from Connellsville coal; ore, Lake Superior; product, Bessemer pig iron; annual capacity, 75,000 gross tons. William Crockard, Furnace Superintendent. (Formerly operated by the Riverside Iron Works.)—*Active in 1901.*

Total annual capacity of the 4 completed furnaces: 430,000 gross tons; of the building furnace, 175,000 tons.

ROLLING MILLS AND STEEL WORKS—9.

Boston Iron and Steel Works, (National Department,) McKeesport, Allegheny county, Pa. Built in 1891-2; 2 double and 22 single puddling furnaces, 7 heating furnaces, one train of muck rolls, and one 16-inch roughing and one 12-inch finishing mill; product, wrought iron and steel skelp and socket iron; annual capacity, 40,000 gross tons of skelp and 9,000 tons of socket iron. Fuel, coal. W. A. Cornelius, Superintendent. (Formerly operated by the National Tube Works Company.)

Elba Rolling Mills, (Continental Department,) Second ave., Pittsburgh, Allegheny county, Pa. Built in 1862; 30 single puddling furnaces, 4 heating furnaces, and 4 trains of rolls (one muck, and one 8, one 10 and one 18-inch); product, wrought iron and steel skelp, all consumed by the Continental Pipe Mills; annual capacity, 40,000 gross tons. Fuel, bituminous coal and producer gas. John O. Edwards, Superintendent. (Formerly called the Elba Iron Works Department and operated by the Oil Well Supply Company.)

Monongahela Steel Works, (National Department,) McKeesport, Allegheny county, Pa. Built in 1892-3; two 8-gross-ton Bessemer steel converters, four 10-foot cupolas, three 5-

hole soaking pits, and one 36-inch 2-high reversing blooming train; first blow made December 14, 1893; product, slabs and billets; annual capacity, 330,000 gross tons of ingots and 300,000 tons of slabs and billets. Fuel, producer gas. W. A. Cornelius, Superintendent. (Formerly operated by the National Tube Works Company.)

National Forge and Iron Works, (National Department,) McKeesport, Allegheny county, Pa. Built in 1882-3 and rebuilt in 1896; 20 charcoal knobbling fires, 2 refinery fires, 2 heating furnaces, 2 steam hammers, and one train of muck rolls; product, charcoal blooms and muck bar; annual capacity, 13,500 gross tons. Fuel, charcoal. W. A. Cornelius, Superintendent. (Formerly operated by the National Tube Works Company.)

National Rolling Mills, (National Department,) McKeesport, Allegheny county, Pa. Built from 1878 to 1893; 6 double and 25 single puddling furnaces, 24 heating furnaces, one train of 2-high slabbing rolls, 2 muck trains, one 82-inch plate mill, and 4 grooved mills (one 13, one 19, and one 22-inch, and one continuous); product, wrought iron and steel skelp; annual capacity, 240,000 gross tons. Fuel, coal and producer gas. W. A. Cornelius, Superintendent. (Formerly operated by the National Tube Works Company.)

Republic Iron Works, (National Department,) Twenty-fifth st., South Side, Pittsburgh, Allegheny county, Pa. Built in 1863; 26 single and 10 double puddling furnaces, 10 heating furnaces, 4 sheet furnaces, one train of muck rolls, 2 grooved mills, (one 14 and one 16-inch,) one 72-inch plate mill, and 8 sheet mills (two 22-inch roughing, and one 20, two 22, one 23, and two 24-inch finishing); product, wrought iron and steel skelp, plates, and sheets; annual capacity, 40,000 gross tons of grooved skelp, 22,500 tons of plates, and 13,500 tons of sheets. Fuel, natural gas and coal. J. W. Keffer, Superintendent. (Formerly operated by the National Tube Works Company.)

Riverside Bar Mill, (Riverside Department,) Wheeling, Ohio county, West Virginia. Built in 1875; 4 coal heating furnaces and 2 trains of rolls (9 and 12-inch); product, steel skelp; annual capacity, 22,500 gross tons. Fuel, coal. (Formerly operated by the Riverside Iron Works.)

Riverside Skelp Mills, (Riverside Department,) Benwood, Marshall county, West Virginia. Built in 1885; 10 regenerative gas heating furnaces and 5 trains of 21-inch grooved rolls; product, steel skelp; annual capacity, 120,500 gross tons. Fuel, producer gas. William Murrins, Superintendent. (Formerly operated by the Riverside Iron Works.)

Riverside Steel Works, (Riverside Department,) Benwood, Marshall county, West Virginia. Built in 1883-4; two 5-gross-ton Bessemer steel converters; first blow made June 11, 1884; two three-hole soaking pits, three 8-foot cupolas, and one 36-inch 2-high reversing blooming mill; product, steel slabs and billets; annual capacity, 150,000 gross tons of ingots and 135,000 tons of slabs and billets. Fuel, producer gas. Orville Marstellar, Superintendent. (Formerly operated by the Riverside Iron Works.)

Total annual capacity of the 9 rolling mills and steel works: Bessemer steel ingots, 480,000 gross tons; slabs and billets, 435,000 tons; skelp, 503,000 tons; plates and sheets, 36,000 tons; charcoal blooms and muck bar, 13,500 tons; and socket iron, 9,000 tons.

Cut-Nail Factories—2.

Riverside Nail Factories, (Riverside Department,) Wheeling, Ohio county, West Virginia. Two factories, one built in 1867 and the other in 1875; 224 cut-nail machines; product, steel cut nails; total annual capacity, 550,000 kegs. Fuel, coal. (Formerly operated by the Riverside Iron Works.)

Galvanized and Kalameined Pipe Works—1.

National Galvanizing Works, (National Department,) Versailles, Allegheny county, Pa. Built in 1895; product, galvanized and kalameined pipe; annual capacity, 54,000 gross tons. H. B. Lynch, Superintendent. (Formerly operated by E. C. Converse.)

Wrought Iron and Steel Pipe and Tube Works—14.

Allison Department, Thirty-second and Walnut sts., Philadelphia, Pa. Product, charcoal iron boiler tubes; sizes from 1½ to 8 inches inclusive; annual capacity, 13,000 gross tons.

H. R. Borie, Superintendent. (Formerly operated by The Allison Manufacturing Company.)

American Department, Middletown, Dauphin county, Pa. Product, wrought iron and steel pipe; sizes from ⅛ of an inch to 16 inches inclusive; annual capacity, 85,000 gross tons. W. D. Matheson, Superintendent. (Formerly operated by the American Tube and Iron Company.)

Chester Department, South Chester, Delaware county, Pa. Product, wrought iron and steel pipe; sizes from 1½ to 12 inches inclusive; annual capacity, 50,000 gross tons. H. R. Borie, Superintendent. (Formerly operated by The Chester Pipe and Tube Company.)

Cohoes Department, Cohoes, Albany county, New York. Product, wrought iron and steel pipe; sizes, from ⅛ of an inch to 2 inches inclusive. Annual capacity, 15,000 gross tons. William Mosley, Superintendent. (Formerly operated by Aird, Don & Curtis.)

Continental Pipe Mills, (Continental Department,) Second avenue, Pittsburgh, Allegheny county, Pa. Product, wrought iron and steel pipe; sizes, from ⅛ of an inch to 8 inches inclusive. Annual capacity, 40,000 gross tons. Thomas J. Bray, Superintendent. (Formerly operated by the Oil Well Supply Company.)

Morris-Tasker Department, New Castle, New Castle county, Delaware. Product, wrought iron and steel pipe; sizes, from ⅜ of an inch to 16 inches inclusive; annual capacity, 60,000 gross tons. H. R. Borie, Superintendent. (Formerly operated by the Delaware Iron Company.)

National Pipe Mills, (National Department,) McKeesport, Allegheny county, Pa. Product, wrought iron and steel pipe and charcoal iron and steel boiler tubes; sizes, from ⅛ of an inch to 30 inches inclusive; annual capacity, 285,000 gross tons. A. M. Saunders, Superintendent. (Formerly operated by the National Tube Works Company.)

Oil City Department, Oil City, Venango county, Pa. Product, wrought iron and steel pipe; sizes, from ⅛ of an inch to 12 inches inclusive; annual capacity, 50,000 gross tons. John O'Shea, Superintendent. (Formerly operated by the Oil City Tube Company).

Pennsylvania Department, Second avenue, Pittsburgh,

Allegheny county, Pa. Product, wrought iron and steel pipe; sizes, from $\frac{1}{8}$ of an inch to 30 inches inclusive; annual capacity, 120,000 gross tons. W. J. McNutt, Superintendent. (Formerly operated by the Pennsylvania Tube Works).

Pittsburgh Department, Second avenue, Pittsburgh, Allegheny county, Pa. Product, wrought iron and steel pipe; sizes, from $\frac{1}{8}$ of an inch to 12 inches inclusive; annual capacity, 36,000 gross tons. W. J. McNutt, Superintendent. (Formerly operated by The Pittsburgh Tube Company).

Riverside Tube Works, (Riverside Department), Benwood, Marshall county, West Virginia. Product, wrought iron and steel pipe; sizes, from $\frac{1}{8}$ of an inch to 8 inches inclusive; annual capacity, 95,000 gross tons. F. A. Peterson, Superintendent. (Formerly operated by the Riverside Iron Works).

Syracuse Department, Syracuse, Onondaga county, New York. Product, wrought iron and steel pipe and charcoal iron and steel boiler tubes; sizes, from $1\frac{1}{4}$ to 7 inches inclusive; annual capacity, 18,000 gross tons. Andrew Telfer, Superintendent. (Formerly operated by the Syracuse Tube Company).

Warren Department, Warren, Trumbull county, Ohio. Product, wrought iron and steel pipe; sizes, from $\frac{1}{4}$ of an inch to 6 inches inclusive; annual capacity, 25,000 gross tons. (Formerly operated by the Ohio Tube Company).

Youngstown Department, Youngstown, Mahoning county, Ohio. Product, wrought iron and steel pipe; sizes, from $1\frac{1}{2}$ to 16 inches inclusive; annual capacity, 30,000 gross tons. James Cooper, Superintendent. A coupling and socket department is being added. (Formerly operated by the American Tube and Iron Company).

Total annual capacity of the 14 wrought iron and steel pipe and tube works: 922,000 gross tons.

SEAMLESS PIPE AND TUBE WORKS—2.

Standard Seamless Tube Works, (Seamless Department), Ellwood City, Lawrence county, Pa. Product, seamless pipe and tubes. R. T. Brown, Superintendent. (Formerly operated by the Standard Seamless Tube Company).

United States Seamless Tube Works, (Seamless Depart-

ment), McKeesport, Allegheny county, Pa. Product, seamless pipe and tubes. E. F. Hollinger, Superintendent. (Formerly operated by the National Tube Works Company).

COKE OVENS.

Semet-Solvay By-Product Coke Ovens, Benwood, Marshall county, West Virginia. Number of ovens, 120; product, coke from Connellsville coal; annual capacity, 200,000 net tons. Plant owned by the National Tube Company but operated under lease by the Semet-Solvay Company. W. O. Wood, Superintendent, Benwood, West Virginia.

COAL LANDS, LIMESTONE QUARRIES, AND IRON-ORE MINES.

The National Tube Company owns tracts of coal lands in Pennsylvania, West Virginia, and Ohio. It also owns an interest in limestone quarries in Lawrence county, Pa.; also in iron-ore mines in the Gogebic and Menominee Ranges of the Lake Superior iron-ore region.

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AMERICAN STEEL AND WIRE COMPANY OF NEW JERSEY.

Practically all the stock of the American Steel and Wire Company of New Jersey is now owned by The United States Steel Corporation.

American Steel and Wire Company of New Jersey, Rookery Building, Chicago, Illinois. *Officers at Chicago*: J. S. Keefe, First Vice-President; F. L. Watson, Treasurer; A. F. Allen, Assistant Treasurer and Secretary; E. C. Lott, Manager Chicago District; Frank Baackes, General Sales Agent; G. A. Cragin and D. A. Merriman, Assistant Sales Agents; Max Pam, General Counsel. *Officers at Cleveland, Ohio*: Wm. P. Palmer, President; C. A. Vogt, Auditor; A. T. DeForest, Manager, and R. W. Ney and J. H. Early, Assistant Managers, Cleveland District; and A. S. Chisholm, Assistant to President, Western Reserve Building. *Officers at Pittsburgh, Pa.*: C. L. Miller, General Superintendent; J. H. Price, Manager; and S. W. Tener, Assistant Manager, Pittsburgh District, Tradesmens Building. *Officers at New York*

City: T. P. Alder, Assistant Treasurer, and F. E. Patterson, Manager and Assistant Secretary, 71 Broadway, New York City. *Officers at Worcester, Massachusetts*: P. W. Moen, Third Vice-President; F. H. Daniels, Chief Engineer; Charles Ranlet, Manager Worcester District; and H. G. Stoddard, Assistant Manager, Worcester District. *Sales Offices and Agents—Domestic*: Chicago, Ill., Rookery Building—F. Baackes, General Sales Agent; G. A. Cragin, and D. A. Merriman, Assistant General Sales Agents. New York City, Empire Building—T. H. Taylor, Assistant General Sales Agent. San Francisco, California, 8-10 Pine st.—George H. Ismon, Pacific Coast Sales Agent. Boston, Mass., 166 High st.—W. M. Atwater, Sales Agent. Butte, Montana, 19 West Granite st.—Charles H. Lane, Sales Agent. Cleveland, Ohio, Western Reserve Building—H. T. Pratt, Sales Agent. Denver, Colorado, 809 Seventeenth st.—American Steel and Wire Company of Colorado; E. R. Pool, President. Los Angeles, Cal., 206 North Los Angeles st.—Burton W. Smith, Sales Agent. Philadelphia, Pa., 707 Filbert st.—F. A. Keyes, Sales Agent. Pittsburgh, Pa., Tradesmens Building—J. D. Sutherland, Sales Agent. Portland, Oregon, 231 Pine st.—E. R. Eldredge, Sales Agent. St. Louis, Mo., 1935 Papin st.—O. B. Barrows, Sales Agent. St. Paul, Minn., 518 Endicott Building—E. A. Lycett, Sales Agent. Salt Lake City, Utah, Grant Brothers, Sales Agents. Seattle, Wash., Dexter-Horton Bank Building—O. D. Colvin, Sales Agent. Spokane, Wash., 514 First ave.—M. K. Lott, Sales Agent. *Foreign*: London, England, 29 Great St. Helens, E. C.—A. Holland, Agent. Montreal, Canada, New York Life Building—George A. Childs, Sales Agent. Hamburg, Germany—A. Auerbach, Agent. Constantinople, Turkey—A. Radliti, Agent. Salonica, Turkey—Jacques Fillipucci, Agent. Smyrna, Turkey—Saparte & Naar, Agents. *Board of Directors*: C. M. Schwab, E. H. Gary, William Edenborn, Alfred Clifford, Wm. P. Palmer, Leslie D. Ward, John S. Keefe, F. Baackes, F. H. Daniels, C. L. Miller, and E. C. Lott. Capital stock issued, $90,000,000, of which $40,000,000 is 7 per cent. cumulative preferred and $50,000,000 is common. Bonded indebtedness, $78,000. The company operates the following works:

BLAST FURNACES—11.

Central Furnaces, Cleveland, Cuyahoga county, Ohio. Three stacks: one, 75 x 20, built in 1881-2 and rebuilt in 1895-6; one McClure and three Whitwell stoves; one, 80 x 20, built in 1887; four fire-brick stoves; and one 100 x 21, built in 1900-1901 and blown in January 17, 1901; four fire-brick stoves, each 22 x 100. Fuel, coke; ore, Lake Superior; product, No. 1 Bessemer pig iron; total annual capacity, 385,000 gross tons. E. B. Tenney, Superintendent Blast Furnaces, Cleveland District. (Formerly operated by the Cleveland Rolling Mill Company.)—*Active in 1901.*

Crown Point Furnaces, Crown Point, Essex county, New York. Two stacks, situated on the bank of Lake Champlain, 60 x 17 and 70 x 18, built in 1872-3; the second stack rebuilt in 1881; six Siemens-Cowper-Cochrane stoves, three 45 x 15 and three 60 x 16; fuel, coke; product, Bessemer pig iron, produced from Crown Point (or Penfield) and Chateaugay ores, and ferromanganese; total annual capacity, 40,500 gross tons. Brand, "Crown Point." (Formerly operated by the Crown Point Iron Company.)—*Active in 1900.*

Edith Furnace, Allegheny, Allegheny county, Pa. One stack, 97¾x20, built and blown in in 1898; one Massicks & Crooke and four Kennedy stoves; fuel, Connellsville coke; ore, Lake Superior; product, Bessemer pig iron; annual capacity 150,000 gross tons. (The old Edith Furnace, 75 x 16½, built in 1882, and abandoned in 1898, is now used as a dust catcher.) Samuel S. Hartranft, Superintendent. (Formerly operated by the Oliver and Snyder Steel Company; later by the Allegheny Furnace Company.)—*Active in 1901.*

Emma Furnace, Cleveland, Cuyahoga county, Ohio. One stack, 72 x 17, built in 1872; remodeled in 1882-3, 1890-1 and 1896; three Ford & Moncur stoves; fuel, Connellsville coke; ore, Lake Superior; product, Bessemer pig iron; annual capacity, 90,000 gross tons. Brand, "Emma." John McCarthy, Furnace Superintendent. (Formerly operated by the Union Rolling Mill Company.)—*Active in 1901.*

Neville Island Furnace, Neville Island, Neville Township, Allegheny county, below Pittsburgh, Pa. One stack, 100 x 21, built in 1900-1901 and blown in July 3, 1901; four Ken-

nedy two-pass stoves; fuel, Connellsville coke; ore, Lake Superior; product, Bessemer pig iron; annual capacity, 165,000 gross tons—*Active in 1901.*

Newburgh Furnace, Cleveland, Cuyahoga county, Ohio. One stack, 65 x 16, built in 1872 and remodeled in 1886; rebuilt in 1895-6; fuel, coke; ore, Lake Superior; product, No. 1 Bessemer pig iron; annual capacity, 50,000 gross tons. (Formerly operated by the Cleveland Rolling Mill Company.) —*Active in 1901.*

Shoenberger Furnaces, Pittsburgh, Allegheny county, Pa. Two stacks: one, 75 x 14, and one, 75 x 16, built in 1865 and rebuilt in 1890; seven Massicks & Crooke stoves; fuel, coke; ore, Lake Superior; product, Bessemer and basic pig iron; total annual capacity, 150,000 gross tons. Henry Oliver, General Superintendent, and John Carnahan, Furnace Superintendent. (Formerly operated by the Shoenberger Steel Company.)—*Active in 1901.*

Total annual capacity of the 11 furnaces: 1,030,500 gross tons.

ROLLING MILLS AND STEEL WORKS—15.

Allentown Works, Allentown, Lehigh county, Pa. Built in 1889 by the Iowa Barb Wire Company; 2 gas heating furnaces, 4 trains of rolls, (9, 10, 14, and 16-inch), and 166 wire-nail machines; product, wire rods drawn into wire and chiefly used by the company in the manufacture of barbed wire and wire nails; annual capacity, 75,000 gross tons of wire rods and 600,000 kegs of wire nails. Fuel, coal and manufactured gas. Brands, "Iowa Barb Wire," "Consolidated Field Fencing," and "Baker Perfect Barb Wire." A galvanizing plant is connected with the works. W. M. Douglass, Superintendent. (Formerly operated by the American Steel and Wire Company of Illinois.)

American Works, Cleveland, Cuyahoga county, Ohio. Built in 1886 by the American Wire Company and first put in operation in November, 1886; new rod mill built in 1888 and first put in operation in January, 1889; one Belgian rod mill, with 6 gas producers, 4 heating furnaces, and 4 trains of rolls; one continuous rod mill, with 3 gas producers, 2 heating furnaces, and 3 trains of rolls; product, steel wire rods

and wire; annual capacity, 125,000 gross tons of rods and 60,000 tons of wire. Fuel, coal. E. Parker, Superintendent. (Formerly operated by the American Steel and Wire Company of Illinois.)

Anderson Works, Anderson, Madison county, Indiana. Built in 1889 by the American Wire Nail Company; 2 continuous heating furnaces, one rod mill, and 186 wire-nail machines; product, steel wire rods, wire, and wire nails; annual capacity, 75,000 gross tons of rods, 70,000 tons of wire, and 1,000,000 kegs of nails. Fuel, natural gas and coal. C. Gaus, Superintendent. (Formerly operated by the American Steel and Wire Company of Illinois.)

Beaver Falls Works, Beaver Falls, Beaver county, Pa. Built and put in operation in 1883 by the Hartman Steel Company, Limited, and enlarged by Carnegie, Phipps & Co., Limited; purchased by the Consolidated Steel and Wire Company in 1895 and enlarged in 1895-6; combination rod train run by 3 engines; 2 heating furnaces, 160 wire blocks, and 142 wire-nail machines; product, steel wire rods, plain, galvanized, and coppered market wire, barbed wire, and wire nails; annual capacity, 100,000 gross tons of wire rods and 850,000 kegs of wire nails. Fuel, bituminous coal and producer gas. Galvanizing and fence departments are connected with the works. W. C. Jones, Superintendent. (Formerly operated by the American Steel and Wire Company of Illinois.)

Braddock Works, Braddock, Allegheny county, Pa. Built in 1891 and put in operation in February 1892; 3 heating furnaces, 3 trains of rolls, (9, 12, and 16-inch), and 112 wire-nail machines; product, steel wire rods, wire, and wire nails; annual capacity, 80,000 gross tons of wire rods, 73,500 tons of rolled and drawn products, and 700,000 kegs of wire nails. Fuel, bituminous coal. August Mann, Superintendent. (Formerly operated by the Pittsburgh Wire Company.)

Consolidated Works, Cleveland, Cuyahoga county, Ohio. Wire-drawing and wire-nail plants built in 1890-1 by the Baackes Wire Nail Company; rod mill added in 1892; 3 heating furnaces, 131 wire-drawing blocks, 264 wire-nail machines, 56 barbed-wire machines, and one 9, one 12, and one 16-inch train of rolls; product, steel wire rods, wire, wire nails, and American and Ellwood field fencing; annual capac-

ity, 80,000 gross tons of rods, 80,000 tons of wire, and 1,000,000 kegs of nails. Fuel, coal and producer gas. A galvanizing plant is connected with the works. G. W. Jewett, Superintendent. (Formerly operated by the American Steel and Wire Company of Illinois.)

H. P. Works, Cleveland, Cuyahoga county, Ohio. Built in 1880 by the H. P. Nail Company and first put in operation in March, 1880; enlarged in 1891; 3 large gas heating furnaces, one 9-inch, one 12-inch, and one 16-inch train of rolls, and 512 wire-nail machines; product, steel wire rods, steel wire, galvanized wire, wire nails, staples, tacks, and rivets; annual capacity, 60,000 gross tons of rods, 90,000 tons of finished products, and 1,500,000 kegs of wire nails. A galvanizing plant is connected with the works; annual capacity 4,500 gross tons of wire. Fuel, coal for boilers and producer gas for the rod mill. Ernst Boley, Superintendent. (Formerly called the H. P. Nail Works and operated by the American Steel and Wire Company of Illinois.)

Newburgh Steel Works, Newburgh, Cuyahoga county, Ohio. Bessemer steel works built in 1867-8 and remodeled and fitted with modern appliances in 1893; first blow made October 15, 1868; two 10-gross-ton converters; annual capacity, 480,000 gross tons of ingots. Open-hearth steel works built in 1876-8 and rebuilt in 1899-1900; one acid and three basic 50-gross-ton furnaces; annual capacity, 120,000 gross tons of ingots. Blooming mill built in 1881 and remodeled in 1891; 4 soaking pits and 2 trains of rolls (one 2-high 33-inch reversing and one 3-high 23-inch); annual capacity, 420,000 tons of blooms, billets, and slabs. Rail mill built in 1857 and remodeled in 1895; 5 heating furnaces and one train of rolls; annual capacity, 150,000 tons of standard rails, girder rails, beams, channels, etc. Two rod mills; annual capacity, 140,000 tons. Structural and bar mills contain one 22-inch structural train of rolls, one 18-inch and one 12-inch bar train; one 9-inch guide and merchant train, and one hoop mill; annual capacity, 55,000 tons of merchant bars and shapes. A foundry, a forge, and a machine shop are also connected with the works. Product, Bessemer and open-hearth steel blooms, billets, and slabs, beams, channels, angles, and other structural shapes, Bessemer steel rails, girder

rail, small T and tram rails, steel wire rods, merchant, spring, toe-calk, and sleigh-shoe steel, steel tires, hoops, and forgings. Fuel, coal for steam and manufactured gas for heating. M. McMurray, General Superintendent. (Formerly operated by the Cleveland Rolling Mill Company.)

New Castle Works, New Castle, Lawrence county, Pa. Built in 1887 and enlarged in 1891; rod mill added in 1889; 3 gas heating furnaces, 4 trains of rolls (9, 10, 12 and 16-inch), and 254 wire-nail machines; product, wire rods, wire, and wire nails; annual capacity, 90,000 gross tons of rods, 75,000 tons of wire, and 1,250,000 kegs of nails. Fuel, coal. Brand, "New Castle." W. C. Stone, Superintendent. (Formerly called the New Castle Wire Nail Works and operated by the Shenango Valley Steel Company.)

Rankin Works, Rankin Station, Allegheny county, Pa. Built in 1885-6 by the Braddock Wire Company; rod mill rebuilt in 1897; 2 heating furnaces, 4 trains of rolls (two 9, one 12, and one 18-inch), 166 wire nail machines, and 80 barbed-wire machines; 4-inch billets rolled directly to No. 5 rods in 18 passes through 4 trains of rolls; product, steel wire rods, plain and galvanized market wire, barbed wire, wire nails, and field fencing; annual capacity, 100,000 gross tons of wire rods and 900,000 kegs of wire nails. Fuel, bituminous coal and manufactured gas. Galvanizing and field fencing plants are connected with the works. W. C. Stone, Superintendent; C. E. Williams, Assistant Superintendent. (Formerly called the Pittsburgh Works and operated by the American Steel and Wire Company of Illinois.)

Shoenberger Works, Fifteenth st. and Penn Ave., Pittsburgh, Allegheny county, Pa. Established in 1824; 24 gas producers, 12 heating furnaces, 4 soaking pits, 4 annealing furnaces, 13 trains of rolls (one 8, two 9, one 16, and one 22-inch bar, one 40 x 24-inch, one 48 x 24-inch, one 60 x 24-inch, and one 72 x 24-inch sheet train, one 34 x 127-inch plate train, 2 blooming mills, and one continuous train), and 12 horseshoe machines. Open-hearth steel department added in 1879; three 35-gross-ton basic furnaces. Two 7-gross-ton Bessemer converters with modern appliances; first blow made March 17, 1886. Product, basic open-hearth steel plates,

sheet steel, skelp steel, iron and steel horse and mule shoes, steel blooms and billets, horseshoe bars, and toe calks; annual capacity, 75,000 gross tons of open-hearth steel ingots, 270,000 tons of Bessemer steel ingots, and 300,000 tons of rolled products. Fuel, natural gas, manufactured gas, and bituminous coal. Henry Oliver, General Superintendent. (Formerly called the Juniata Iron and Steel Works and operated by the Shoenberger Steel Company.)

South Side Works, Eighth and Bingham sts., Pittsburgh, Allegheny county, Pa. Rod mill built in 1884 and first put in operation June 12, 1884; 2 continuous heating furnaces and 4 trains of rolls (two 9, one 12, and one 18-inch); product, wire rods; annual capacity, 90,000 gross tons. Wire department contains machinery for the manufacture of plain and barbed wire and wire nails; number of wire-nail machines, 204; annual capacity, 150,000 gross tons of drawn wire, 31,500 tons of barbed wire and fencing specialties, and 960,000 kegs of wire nails. Fuel, natural gas and coal. Brand, "Oliver." C. Evans, Superintendent. (Formerly operated by the Oliver Wire Company.)

South Works, Worcester, Worcester county, Massachusetts. Rolling mill built in 1846; 12 heating furnaces, one 34-inch blooming mill, and 5 rod mills; product, billets, iron and steel wire rods, and wire; annual capacity, 135,000 gross tons of rods. Open-hearth steel department contains one 15 and three 20-gross-ton acid furnaces and four 50-gross-ton basic furnaces; first open-hearth steel made September 26, 1885; annual capacity, 170,000 gross tons of ingots. Fuel, coal and manufactured gas. J. O. E. Trotz, Superintendent. (Also called the Quinsigamond Works; formerly operated by the Washburn and Moen Manufacturing Company.)

Twenty-sixth Street Works, Twenty-seventh and Smallman sts., Pittsburgh, Allegheny county, Pa. Bessemer steel plant built in 1881 and remodeled in 1891; two 5-gross-ton converters; first blow made August 26, 1881; 2 heating furnaces and one train of 32-inch rolls; product, billets, blooms, and slabs, from 4 x 4 inches to 20 x 8 inches; annual capacity, 185,000 gross tons of ingots and 170,000 tons of billets and slabs. Fuel, natural gas and coal. C. F. Berkenbush,

Superintendent. (Formerly operated by the Oliver and Snyder Steel Company.)

Waukegan Works, Waukegan, Lake county, Illinois. Built in 1891; destroyed by fire in 1899 and immediately rebuilt; put in operation in September, 1900; 6 heating furnaces for 4-inch steel wire billets, one heating furnace for 1⅛-inch steel billets, and one wire-rod rolling mill for steel or copper, consisting of one 15-inch, two 12-inch, and two 11-inch trains of rolls; product, wire rods and wire; annual capacity, 100,000 gross tons. Fuel, coal and coke. Works also produce all kinds of coarse steel and copper wire, galvanized wire, bale ties, barbed-wire fencing, staples, etc. F. C. Gedge, Superintendent. (Formerly operated by the Washburn and Moen Manufacturing Company).

Total annual capacity of the 15 rolling mills and steel works: Bessemer steel ingots, 935,000 gross tons; open-hearth steel ingots, 365,000 tons; billets, slabs, etc., 890,000 tons; wire rods and other rolled products, not including billets or slabs, 1,755,000 tons.

Wire-Rod Plants, 13; Wire-Drawing Plants, 23; and Wire-Nail Plants, 16.

Allentown Works, Allentown, Pa. Product, rods, wire, and wire nails. Rods: annual capacity, 75,000 gross tons. Wire: sizes, from No. 00 to No. 20 gauge; annual capacity, 65,000 tons. Nails: number of machines, 166; all sizes; annual capacity, 600,000 kegs. (Formerly operated by the American Steel and Wire Company of Illinois).

American Works, Cleveland, Ohio. Product, rods and wire. Rods: annual capacity, 125,000 gross tons. Wire: sizes, from ⅞ of an inch down to No. 34 gauge; annual capacity, 60,000 tons. (Formerly operated by the American Steel and Wire Company of Illinois).

Anderson Works, Anderson, Indiana. Product, rods, wire, and wire nails. Rods: annual capacity, 75,000 gross tons. Wire: sizes, from No. 000 to No. 24 gauge, inclusive; annual capacity, 70,000 tons. Nails: number of machines, 186; all sizes; annual capacity, 1,000,000 kegs. (Formerly operated by the American Steel and Wire Company of Illinois).

Beaver Falls Works, Beaver Falls, Pa. Product, rods, wire, and wire nails. Rods: annual capacity, 100,000 gross tons. Wire: sizes, from $\frac{3}{8}$ of an inch to No. 20 gauge; annual capacity, 65,000 tons. Nails: number of nail machines, 142; all sizes; annual capacity, 850,000 kegs. (Formerly operated by the American Steel and Wire Company of Illinois).

Braddock Works, Braddock, Pa. Product, Bessemer and basic open-hearth steel rods, wire, and wire nails. Rods: annual capacity, 80,000 gross tons. Wire: sizes, from $\frac{3}{4}$ of an inch down to 1 32 of an inch in diameter; annual capacity, 70,000 tons. Nails: number of machines, 112; all sizes; annual capacity, 700,000 kegs. (Formerly operated by the Pittsburgh Wire Company).

Central Works, Worcester, Massachusetts. Product, bright, coppered, tinned, and annealed wire; sizes, from $\frac{1}{2}$ of an inch to No. 33 gauge; annual capacity, 20,000 gross tons. (Formerly operated by the Worcester Wire Company).

Consolidated Works, Cleveland, Ohio. Product, rods, wire, and wire nails. Rods: annual capacity, 80,000 gross tons. Wire: sizes, from rod down to No. 19 gauge; annual capacity, 80,000 tons. Nails: number of machines, 264; sizes, from $\frac{5}{8}$ of an inch to 9 inches; annual capacity, 1,000,000 kegs. (Formerly operated by the American Steel and Wire Company of Illinois).

De Kalb Works, De Kalb, Illinois. Product, wire and wire nails. Wire: sizes, from No. 0 to No. 20 gauge; annual capacity, 75,000 gross tons. Nails: number of machines, 152; standard sizes; annual capacity, 840,000 kegs. (Formerly called the Elwood Works and operated by the American Steel and Wire Company of Illinois).

Granite City Works, Granite City, Illinois. Product, market wire, annealed and galvanized barbed wire, steel wire nails, hog and cattle wire, etc. Wire: sizes, from No. 0 to No. 14 gauge of steel wire; annual capacity, 24,000 gross tons. Nails: number of machines, 32; sizes, from 3 to 40-penny; annual capacity, 75,000 kegs. (Formerly operated by the Continental Wire Company; later by the Merchants Wire and Nail Company).

H. P. Works, Cleveland, Ohio. Product, rods, wire, and

wire nails. Rods: annual capacity, 60,000 gross tons. Wire: sizes, from 1-inch shafting down to No. 25 gauge; annual capacity, 60,000 tons. Nails: number of machines, 512; all sizes; annual capacity, 1,500,000 kegs. (Formerly called the H. P. Nail Works and operated by the American Steel and Wire Company of Illinois).

Joliet, Illinois, Bluff Street Works, Joliet, Illinois. Product, bright, annealed, and galvanized wire; sizes, from No. 2 to No. 18 gauge; annual capacity, 40,000 gross tons. (Formerly called the Joliet Works and operated by the Consolidated Barb Wire Company).

Joliet, Illinois, Meeker Avenue Works, Joliet, Illinois. Product, wire; sizes, from No. 0 to No. 22 gauge; annual capacity, 7,500 gross tons of wire for bale ties, box straps, wire nails, staples, etc. (Formerly operated by The Laidlaw Bale Tie Company).

Joliet, Illinois, Rockdale Works, near Joliet, Illinois. Product, wire; sizes, from No. 2 to No. 22 gauge inclusive; annual capacity, 65,000 gross tons. (Formerly operated by the American Steel and Wire Company of Illinois).

Joliet, Illinois, Scott Street Works, Joliet, Illinois. Product, wire and wire nails. Wire: sizes, from No. 00 to No. 22 gauge inclusive; annual capacity, 100,000 gross tons. Nails: number of machines, 266; standard sizes; annual capacity, 1,500,000 kegs. (Formerly called the Joliet Works and operated by the American Steel and Wire Company of Illinois.)

Newburgh Steel Works, Newburgh, Ohio. Product, wire rods; annual capacity, 140,000 gross tons. M. McMurray, General Superintendent. (Formerly operated by the Cleveland Rolling Mill Company.)

Newburgh Wire Works, Newburgh, Ohio. Product, wire, barbed wire, and wire nails. Wire: sizes, from $\frac{3}{8}$ of an inch to No. 33 gauge; annual capacity, 90,000 gross tons. Barbed wire: annual capacity, 18,000 tons. Nails: number of machines, 30; all sizes; annual capacity, 240,000 kegs. M. McMurray, General Superintendent, and C. R. Putnam, Superintendent. (Formerly operated by the Cleveland Rolling Mill Company.)

New Castle Works, New Castle, Pa. Product, rods, wire,

and wire nails. Rods: annual capacity, 90,000 gross tons. Wire: sizes, from $\frac{3}{8}$ of an inch to No. 22 gauge; annual capacity, 75,000 tons. Nails: number of machines, 254; sizes, from 2-penny fine to 60-penny common; annual capacity, 1,250,000 kegs. (Formerly called the New Castle Wire Nail Works and operated by the Shenango Valley Steel Company.)

North Works, Worcester, Mass. Product, wire, barbed wire, wire rope, wire nails, insulated wire, galvanized wire, cables, etc. Wire: all sizes down to .003 of an inch in diameter; annual capacity, 100,000 gross tons. Nails: number of machines, 113; all sizes and kinds; annual capacity, 200,000 kegs. E. J. Watson, Superintendent. (Formerly operated by the Washburn and Moen Manufacturing Company.)

Pacific Works, San Francisco, California. Product, street railway and submarine cable, plain, and copper wire, wire rope, and wire nails. Wire; sizes, from $\frac{3}{8}$ of an inch to No. 36 gauge; annual capacity, 15,000 gross tons of plain wire and 7,500 tons of rope and cable. Nails: number of machines, 32; sizes, from 2-penny to 12-inch spikes; annual capacity 120,000 kegs. (Formerly operated by the Washburn and Moen Manufacturing Company.)

Rankin Works, Rankin Station, Pa. Product, rods, wire, and wire nails. Rods: annual capacity, 100,000 gross tons. Wire: all sizes: annual capacity, 90,000 tons. Nails: number of machines, 166; all sizes; annual capacity, 900,000 kegs. (Formerly called the Pittsburgh Works and operated by the American Steel and Wire Company of Illinois.)

Salem Works, Salem, Ohio. Product, wire and wire nails. Wire: sizes, from rod down to No. 21 gauge; annual capacity, 36,000 gross tons. Nails: number of machines, 124; sizes, from $\frac{1}{4}$ of an inch to 7 inches; annual capacity, 650,000 kegs. (Formerly operated by the American Steel and Wire Company of Illinois.)

South Side Works, Pittsburgh, Pa. Product, rods, wire, and wire nails. Rods: annual capacity, 90,000 gross tons. Wire: sizes, from $\frac{3}{8}$ of an inch to No. 20 gauge; annual capacity, 150,000 tons. Nails: number of machines, 204; sizes, from $\frac{1}{4}$ of an inch to 9 inches; annual capacity, 960,000 kegs. (Formerly operated by the Oliver Wire Company.)

South Works, Worcester, Massachusetts. Product, rods

and wire. Rods: annual capacity, 135,000 gross tons. Wire: sizes, from ½ of an inch to No. 20 gauge; annual capacity, 105,000 tons. (Formerly operated by the Washburn and Moen Manufacturing Company.)

Waukegan Works, Waukegan, Ill. Product, rods and wire. Rods: annual capacity, steel or copper, 100,000 gross tons. Wire: sizes, from ½ of an inch to No. 22½ gauge; annual capacity, 100,000 tons. (Formerly operated by the Washburn and Moen Manufacturing Company.)

Total annual capacity: Wire rods, 1,250,000 gross tons; wire, 1,562,500 tons; wire nails, 12,385,000 kegs of 100 pounds.

Iron-Ore Mines, Coal Lands, Coke Ovens, etc.

The American Steel and Wire Company of New Jersey controls the Sauntry Iron Ore Mine in St. Louis county, Minnesota, the Alpena Mine, adjoining the Sauntry Mine on the north, and the Clark Mine, all in the Mesabi Range; the Atlantic Mine, at Iron Belt, Wisconsin, in the Gogebic Range; the Negaunee Mine, at Negaunee, and the Moore Mine, in Michigan, in the Marquette Range; and the Cuff Mine, in Dickinson county, and the Hill Top Mine, at Crystal Falls, Michigan, in the Menominee Range, all located in the Lake Superior iron-ore region. In addition it owns 1,364 acres of coal lands in Westmoreland county, 8,313 acres in Fayette county, and 2,330 acres in Greene county, Pa. It also owns 1,630 coke ovens in Westmoreland and Fayette counties, Pa., now operated by the American Coke Company, and a one-half interest in 250 additional ovens at Dawson, Fayette county, Pa., operated by the Juniata Coke Company. It also operates limestone quarries at Williamsburg, Pa.

The company also owns 12 steamers, with an aggregate annual ore-carrying capacity of 1,252,100 gross tons. (For a description of these vessels see pages 65-6.)

AMERICAN TIN PLATE COMPANY.

Practically all the stock of the American Tin Plate Company is now owned by The United States Steel Corporation.

American Tin Plate Company; general offices, Battery Park Building, New York. *Officers*: Daniel G. Reid, President; William T. Graham, First Vice-President; Warner Arms, Second Vice-President; Warner Leeds, Third Vice-President; Frederick S. Wheeler, Treasurer; E. G. Applegate, Secretary; H. B. Wheeler, Assistant Secretary; and William P. Beaver, Auditor. *Engineering Department*: Carnegie Building, Pittsburgh; C. W. Bray, Chief Engineer. *Board of Directors*: Daniel G. Reid, William H. Moore, William B. Leeds, William T. Graham, James H. Moore, James McLean, James B. Dill, Frederick S. Wheeler, Warner Arms, George Greer, Warner Leeds, Cecil A. Robinson, William E. Reis, James A. Matthews, and Richard R. Quay. *Executive Committee*: William B. Leeds, Chairman; Daniel G. Reid, Warner Arms, William T. Graham, and William H. Moore. Capital stock, $50,000,000, of which $20,000,000 is 7 per cent. cumulative preferred and $30,000,000 is common. The company operates the following works:

ROLLING MILLS—28 COMPLETED AND 1 BUILDING.

Unless otherwise stated the annual capacity of the rolling mills named below is given on triple turn.

American Works, Elwood, Madison county, Indiana. Built in 1891-2 and first put in operation in June, 1892; 52 heating furnaces, 9 annealing furnaces, and 26 hot and 20 cold mills; one bar mill, with two stands of 3-high rolls, one stand of bull heads, and 2 continuous heating furnaces; product, black plates for tin and terne plates; annual capacity, double turn, 52,000 gross tons. Fuel, natural gas exclusively. Make tin and terne plates. The hot and cold trains of rolls with which the Montpelier Works of the American Tin Plate Company, at Montpelier, Indiana, were formerly equipped were removed to the American Works in January, 1900. (Formerly called the Elwood Works and operated by The American Tin Plate Company.)

Anderson Works, Anderson, Madison county, Indiana. Built in 1894-5 and put in operation August 1, 1895; 7 double heating furnaces, one large annealing furnace, and 7 hot and 6 cold mills; product, black plates for tinning; annual capac-

ity, 14,000 gross tons. Fuel, natural gas. Make tin and terne plates. (Formerly operated by the National Tin Plate Company.)

Atlanta Works, Atlanta, Hamilton county, Indiana. Built in 1894-5 and put in operation in March, 1895; 6 double heating furnaces, 3 annealing furnaces, and 6 hot and 4 cold mills; product, black plates for tinning and light sheets up to No. 34 gauge and in sizes up to 30 x 96 inches; annual capacity, 12,000 gross tons. Fuel, natural gas. Make tin and terne plates. (Formerly operated by The Atlanta Steel and Tin Plate Company.)

Banfield Works, Irondale, Jefferson county, Ohio. Works, which were originally built by the Pioneer Iron Company in 1868, then consisted of a blast furnace, a rolling mill, a galvanizing plant, and a square mile of coal property; bought and refitted by Wallace, Banfield & Co., who erected two sheet mills in 1884. Present plant contains 4 double heating furnaces, 2 annealing furnaces, and four 24-inch hot and three 24-inch cold mills; product, black plates for tinning; annual capacity, 8,000 gross tons. Fuel, coal. Make tin and terne plates. (Formerly called the Irondale Rolling Mill and operated by Wallace, Banfield & Co.)

Beaver Works, Lisbon, Columbiana county, Ohio. Built in 1894-5 and first put in operation April 10, 1895; 7 sheet and 7 pair furnaces, 4 double annealing furnaces, and seven 24 x 32-inch hot and seven 22 x 34-inch cold mills; product, black plates for tinning; annual capacity, 14,000 gross tons. Fuel, bituminous coal. Make tin and terne plates. (Formerly operated by The Beaver Tin Plate Company.)

Cambridge Works, Cambridge, Guernsey county, Ohio. Built in 1894 and first put in operation January 1, 1895; 6 double heating furnaces, 5 annealing furnaces, and six 24 x 32-inch hot and six 20 x 32-inch cold mills; product, black plates for tinning; annual capacity, 12,000 gross tons. Fuel, bituminous coal. Make tin and terne plates. (Formerly operated by The Morton Tin Plate Company.)

Canonsburg Works, Canonsburg, Washington county, Pa. Built in 1882; 5 double sheet and pair furnaces, 6 annealing furnaces, one hammer, 2 bar mills, (one 2-high and one 3-high,) one sheet mill, 4 black plate mills, and 6 cold mills;

product, fine sheet iron and steel for stamping and tinning purposes; annual capacity, 10,000 gross tons. Fuel, natural gas. (Formerly operated by the Canonsburg Iron and Steel Company.)

Chester Works, Chester, Hancock county, West Virginia. Post office address, East Liverpool, Ohio. Built in 1899-1900 by the Chester Rolling Mill Company, and equipped with machinery for the manufacture of sheet steel; acquired by the American Sheet Steel Company in 1900, and purchased by the American Tin Plate Company in 1901. The works are now being equipped with 7 sheet furnaces, 7 pair furnaces, 3 annealing furnaces, one 26 x 52-inch sheet mill, six 26 x 32-inch black plate mills, all hot, and seven cold mills, (one 26 x 52 and six 26 x 32-inch); product, black plates for tinning and large sheets; annual capacity, 12,000 gross tons; fuel, coal. The plant is expected to be ready for operation by November 1, 1901. Will make tin and terne plates.

Crescent Works, Cleveland, Cuyahoga county, Ohio. Built in 1895 and first put in operation June 1, 1895; 6 pair and 6 heating furnaces, 6 annealing furnaces, and six 24 x 32-inch hot and six 20 x 30-inch cold mills; product, black plates for tinning and stamping; annual capacity, 12,000 gross tons. Fuel, coal. Make tin and terne plates. (Formerly operated by The Crescent Sheet and Tin Plate Company.)

Cumberland Works, Cumberland, Allegany county, Maryland. Black plate mill added to rolling mill in 1892 and first black plates made in 1893; 5 sheet and 5 pair furnaces, one annealing furnace, two 24-inch and three 26-inch hot mills, and six 22-inch cold mills; product, black plates for tinning; annual capacity, 8,000 gross tons. Fuel, coal. (Formerly operated by the Cumberland Steel and Tin Plate Company.)

Ellwood City Works, Ellwood City, Lawrence county, Pa. Built in 1892-3 and first put in operation April 1, 1893; 6 double sheet and pair furnaces, one annealing furnace, and six 24-inch hot and six 20-inch cold mills; product, black plates for tinning and cold-rolled steel sheets; annual capacity, 12,000 gross tons. Fuel, coal. Make tin and terne plates. (Formerly called the Ellwood Tin Plate Works and operated by the Ellwood Tin Plate Company.)

Falcon Works, Niles, Trumbull county, Ohio. Built in

1892-3 and first put in operation in April, 1893; 12 sheet and pair furnaces, one annealing furnace, and six 24 x 32-inch hot and eight 22 x 34-inch cold mills; product, black plates for tinning; annual capacity, 12,000 gross tons. Fuel, bituminous coal and slack. Make tin and terne plates. (Formerly operated by the Falcon Tin Plate and Sheet Company.)

Great Western Works, Joliet, Will county, Illinois. Built in 1891-2 and first put in operation May 1, 1892; 4 double sheet and pair furnaces, 2 annealing furnaces, and four 24 x 32-inch hot and four 20 x 32-inch cold mills; product, black plates for tinning; annual capacity, 7,000 gross tons. Fuel, coal. Make tin and terne plates. (Formerly called the Joliet Sheet Mill and operated by the Great Western Tin Plate Company.)

Humbert Works, South Connellsville, Fayette county, Pa. Built in 1896 and first put in operation October 31, 1896; 6 double sheet and pair furnaces, 3 annealing furnaces, and six 24 x 32-inch hot and six 22 x 30-inch cold mills; product, black plates for tinning; annual capacity, 12,000 gross tons. Fuel, coal. Make tin and terne plates. (Formerly called the South Connellsville Plant and operated by the Humbert Tin Plate Company.)

Irondale Works, Middletown, Henry county, Indiana. Built in 1893-4, utilizing machinery from the Irondale Steel and Iron Company's mill at Anderson, which was destroyed by fire on October 31, 1893; 12 pair and sheet furnaces, one 24 x 40 and five 24 x 32-inch hot mills, and one 29 x 44 and four 20 x 34-inch cold mills; product, black plates for tinning; annual capacity, 10,000 gross tons. Fuel, natural gas. (Formerly operated by The Irondale Steel and Iron Company).

Johnstown Works, Johnstown, Cambria county, Pa. Built in 1898 and first put in operation in May, 1898; 4 sheet and pair furnaces, one annealing furnace, two 24 x 32-inch hot mills, and three 20 x 36-inch cold mills; product, black plates for tinning; annual capacity, 3,750 gross tons. Fuel, bituminous coal. Make tin and terne plates. (Formerly called the Johnstown Tinplate Works and operated by the Johnstown Tinplate Company).

La Belle Works, Wheeling, Ohio county, West Virginia. Black plate mill added to rolling mill in 1893 and first black

plates made in April, 1894; 10 sheet and 10 pair furnaces, 4 annealing furnaces, and one 24 x 36 and nine 24 x 32-inch hot and ten 22 x 32 inch cold mills; product, black plates for tinning; annual capacity, 20,000 gross tons. Fuel, natural gas. Make tin and terne plates. (Formerly operated by the La Belle Iron Works, which still operate the remainder of the plant.)

Laughlin Works, Martins Ferry, Belmont county, Ohio. Black plate mill added to rolling mill in 1895 and first black plates made in August, 1895; 22 sheet and 22 pair furnaces, 6 annealing furnaces, and twenty-two 26 x 32-inch hot and eighteen 22 x 34-inch cold mills; product, black plates for tinning; annual capacity, 30,000 gross tons. Fuel, coal. Make tin and terne plates. (Formerly operated by the Laughlin Nail Company, which still operates the remainder of the plant.)

Monongahela Works, South Fifteenth st., Pittsburgh, Allegheny county, Pa. Built in 1894-5 and first put in operation February 14, 1895; 14 sheet and 14 pair furnaces, 5 annealing furnaces, and fourteen 24 x 32-inch hot and twelve 20 x 32-inch cold mills; product, black plates for tinning; annual capacity, 24,000 gross tons. Fuel, bituminous coal. Make tin and terne plates. (Formerly operated by the Monongahela Tin Plate Company.)

Morewood Works, Gas City, Grant county, Indiana. Built in 1892-3 and first put in operation in December, 1893; 8 sheet and 8 pair furnaces, 2 annealing furnaces, one bar mill, and 8 hot and 8 pairs of cold mills; product, black plates for tinning; annual capacity, 16,000 gross tons. Fuel, natural gas. Make tin and terne plates. (Formerly called the Gas City Tinplate Works and operated by The Morewood Company.)

Muskegon Works, Muskegon, Muskegon county, Michigan. Black plate mill added to rolling mill in 1899 and first black plates made in 1900; 6 double heating furnaces, 2 annealing furnaces, 6 single pair furnaces, and six 26-inch hot and five 24-inch cold mills. Product, iron and steel black plates for tinning; annual capacity, 12,000 gross tons. Fuel, coal and manufactured gas. Make tin and terne plates. (Formerly called the Muskegon Rolling Mills and operated by

the Champion Iron and Steel Company. The American Rolling Mill Company now operates the remainder of the plant.)

National Works, Monessen, Westmoreland county, Pa. Built in 1897-8 and first put in operation in January, 1898; 24 sheet and 24 pair furnaces, 6 annealing furnaces, and twenty-four 24 x 32-inch hot and eighteen 22 x 32-inch cold mills; product, black plates for tinning; annual capacity, 50,000 gross tons. Fuel, coal. Make tin and terne plates. (Formerly operated by the National Tin Plate Company of Pennsylvania.)

New Castle Works, New Castle, Lawrence county, Pa. Built in 1892-3 and first put in operation in October 1893; 20 pair and 20 sheet furnaces, 7 annealing furnaces, twenty 24 x 32-inch hot and twenty-one 20 x 22-inch cold mills; product, black plates for tinning; annual capacity, 40,000 gross tons. Fuel, bituminous coal. Make tin and terne plates. (Formerly operated by the New Castle Steel and Tin Plate Company, Incorporated.)

Pennsylvania Works, New Kensington, Westmoreland county, Pa. Built in 1894 and first put in operation in 1895; 8 sheet and 8 pair furnaces, 3 annealing furnaces, and six 24 x 32-inch hot and six 22 x 32-inch cold mills; product, black plates for tinning; annual capacity, 12,000 gross tons. Fuel, coal. Make tin and terne plates. (Formerly operated by the Pennsylvania Tin Plate Company.)

Pittsburgh Works, New Kensington, Westmoreland county, Pa. Built in 1894 and first put in operation in December, 1894; 7 sheet, 7 pair, and 4 annealing furnaces, three 24 x 28-inch, one 24 x 36-inch, and two 24 x 32-inch hot mills, and seven 22 x 36-inch cold mills; product, black plates for tinning and soft stamping sheets; annual capacity, 14,000 gross tons. Fuel, bituminous coal. Make tin and terne plates. (Formerly operated by the Pittsburgh Tin Plate Works.)

Reeves Works, Canal Dover, Tuscarawas county, Ohio. Built in 1895; 6 sheet furnaces, 6 pair furnaces, 6 annealing furnaces, and six 24-inch hot and six 24-inch cold mills; product, black plates for tinning and black steel sheets; annual capacity, 12,000 gross tons. Fuel, bituminous coal. Make tin and terne plates. (Formerly operated by The Reeves Iron Company.)

Shenango Works, New Castle, Lawrence county, Pa. Built in 1897-8 and first put in operation in April, 1899; 30 sheet and 30 pair furnaces, 8 annealing furnaces, and thirty 26 x 32-inch hot and thirty 22 x 34-inch cold mills; product, black plates for tinning; annual capacity, 60,000 gross tons. Fuel, coal. Make tin and terne plates. (Works partly built by the Shenango Valley Steel Company and completed and started by the American Tin Plate Company.)

Star Works, foot of Twelfth street, Pittsburgh, Allegheny county, Pa. Built in 1895 and first put in operation January 6, 1896; 16 sheet and pair furnaces, 5 annealing furnaces, and six 24 x 32-inch hot and nine 22 x 32-inch cold mills; product, black plates for tinning; annual capacity, 16,000 gross tons. Fuel, bituminous coal. Make tin and terne plates. (Formerly operated by the Star Tin Plate Company.)

United States Works, Demmler (eighth ward, McKeesport), Allegheny county, Pa. Built in 1873-4, burned and rebuilt in 1883; 11 sheet and 11 pair furnaces, 6 annealing furnaces, and 11 hot and 11 cold mills; product, refined and cold-rolled black sheet iron, Bessemer and open-hearth steel sheets, and black plates for tinning; annual capacity, 18,000 gross tons. Fuel, bituminous coal. Make tin and terne plates. (Formerly operated by the United States Iron and Tin Plate Manufacturing Company.)

Total annual capacity of the 28 completed rolling mills, on triple turn; 522,750 gross tons of black plates or sheets for tinning, stamping, etc.; of the building mill, 12,000 tons.

TINPLATE WORKS—25 COMPLETED AND 1 BUILDING.

Unless otherwise stated the weekly capacity of the tinplate works named below is given in boxes of 100 pounds and on double turn.

American Works, Elwood, Madison county, Indiana. Built in 1891-2 and first tin and terne plates made in July, 1892; 59 sets; weekly capacity, 30,000 base boxes of tin and terne plates of various weights. Fuel, natural gas. Brands: for tinplates, "Hazen," "Premier," "Imperial," and "Peerless" for charcoal, and "Hazen," "Kream," "Kanner," "L-Wood," and "Koko" for coke; for terne plates,

"L-e-e-d-s," "E-l-w-o-o-d," "I-n-d-i-a-n-a," and "R-e-i-d." The tinning sets formerly in the Montpelier Works of the American Tin Plate Company, at Montpelier, Ind., were removed to the American Works in 1896. (Formerly called the Elwood Works and operated by The American Tin Plate Company.)

Anderson Works, Anderson, Madison county, Indiana. Built in 1894-5 and first tin and terne plates made in August, 1895; 10 sets; weekly capacity, 6,000 boxes of tin or terne plates. Fuel, natural gas. Brands: for tinplates, "Donner", "Irwin," "Matter," and "Eagle" for charcoal and "Anderson" and "National" for coke. (Formerly operated by The National Tin Plate Company).

Atlanta Works, Atlanta, Hamilton county, Indiana. Built in 1892-3 and first tinplates made in March and first terne plates in April, 1893; 8 sets; weekly capacity, 4,000 boxes. Fuel, natural gas. Brand, "Atlanta" for coke tinplates and for terne plates. (Formerly operated by The Atlanta Steel and Tin Plate Company).

Banfield Works, Irondale, Jefferson county, Ohio. Tinning plant added to rolling mill in 1891; enlarged in 1892; 10 tinning machines; product, tin and terne plates; weekly capacity, 2,800 boxes of tinplates and 200 boxes of terne plates. Tinned sheets 40 inches wide and 96 inches long are produced at this plant. Fuel, coal. Brands: for tinplates, "*B," "*A," "*AA," and "*AAA," for charcoal and "*C" and "*BC" for coke; for terne plates, Diamond "B," "A," "AA," "AAA," "WB," and "OS." (Formerly called the Irondale Tin and Terne Plate Works and operated by Wallace, Banfield & Co.)

Beaver Works, Lisbon, Columbiana county, Ohio. Built in 1894-5 and first tin and terne plates made in April, 1895; 14 sets; weekly capacity, 6,000 boxes of tin and terne plates. Fuel, bituminous coal. Brands: for tinplates, "Beaver" coke and "Beaver A," "Beaver AA," and "Beaver AAA" charcoal; for terne plates, "Beaver," "Beaver Special," "Beaver Extra," and "Beaver Best." (Formerly operated by The Beaver Tin Plate Company).

Cambridge Works, Cambridge, Guernsey county, Ohio. Built in 1894 and first tin and terne plates made in March, 1895; 9 sets for tin and terne plates; weekly capacity, 5,000

boxes. Fuel, bituminous coal. Brands: for tinplates, "Guernsey," "Morton," "Regent," and "White Rose" for charcoal and "Cambridge" and "Thistle" for coke; for terne plates, "American Standard," "Cambridge Old Style," "Cambridge New Method," "Leatherwood," "Economy," "North Star," "Neptune," "Paragon," and "Cambridge Redipped." (Formerly called the Morton Tin Plate Works and operated by The Morton Tin Plate Company).

Chester Works, Chester, Hancock county, West Virginia. Post office address, East Liverpool, Ohio. Adding a tin-dipping plant to a rolling mill, to contain 12 sets, 8 for tinplates and 4 for terne plates; weekly capacity, 4,000 boxes of tinplates and 2,000 boxes of terne plates. Fuel, coal. Plant will probably be completed and in operation by November 1, 1901.

Crescent Works, Cleveland, Cuyahoga county, Ohio. Built in 1894-5 and first tin and terne plates made in January, 1896; 11 sets for tin and terne plates; weekly capacity, 5,400 boxes. Fuel, coal. Brands: for tinplates, "A," "AA," and "AAA" in a crescent for charcoal and "C" in a crescent for coke; for terne plates, "*," "**," and "***" in a crescent. (Formerly operated by The Crescent Sheet and Tin Plate Company).

Ellwood City Works, Ellwood City, Lawrence county, Pa. Tinning plant added to rolling mill in 1894 and first tin and terne plates made in January, 1895; 16 sets for tin and terne plates; weekly capacity, 5,400 boxes. Fuel, coal. Brands: for tinplates, "Silverine," "Saturn," "Anti-Rust," and "P. O. P." for charcoal and "American" and "American Palm" for coke; for terne plates, "Monogram," "N. C. T.," "Charter Oak," "Banner," "Weather Proof," and "MF." Trademark, a red star. (Formerly called the Ellwood Tin Plate Works and operated by the Ellwood Tin Plate Company).

Falcon Works, Niles, Trumbull county, Ohio. Tinning plant added to rolling mill in 1895 and first tin and terne plates made in March, 1895; 12 sets for tin and terne plates; weekly capacity, 5,400 boxes. Fuel, bituminous coal. Brands: for tinplates, "Tulip," "Crocus," "Hyacinth," "Jonquil" and "Daisy" for charcoal and "Clover" for coke; for terne plates, "Official Seal," "Cornflower," "Sweet Brier," "Holly Wood," "Golden Rod," "Mayflower," "Moonflower,"

"Starflower," "Sunflower," and "Wildflower." (Formerly operated by the Falcon Tin Plate and Sheet Company).

Great Western Works, Joliet, Will county, Illinois. Tinning plant added to rolling mill in 1895 and first tin and terne plates made in March, 1895; 8 sets for tin and terne plates; weekly capacity, 3,000 boxes. Fuel, oil. Brands: for tinplates, "Moose" for charcoal and "Elk" for coke; for terne plates; "Duck," "Drake," and "Swan." (Formerly operated by the Great Western Tin Plate Company).

Humbert Works, South Connellsville, Fayette county, Pa. Built in 1896 and first tinplates made December 4, 1896; 12 sets for tin and terne plates; weekly capacity, 6,000 boxes. Fuel, natural gas. Brand, "Humbert." (Formerly called the South Connellsville Plant and operated by the Humbert Tin Plate Company).

Johnstown Works, Johnstown, Cambria county, Pa. Built in 1898 and first put in operation in May, 1898; 3 sets for tin and terne plates; weekly capacity, 1,800 boxes. Fuel, bituminous coal. (Formerly called the Johnstown Tinplate Works and operated by the Johnstown Tinplate Company).

La Belle Works, Wheeling, Ohio county, West Virginia. Tinning plant added to rolling mill in 1895; first tinplates made in July, 1895, and first terne plates in January, 1896; 15 sets for tin and terne plates; weekly capacity, 9,000 boxes. Fuel, natural gas. Brands: for tinplates, "La Belle" for coke and "Woodward A" and "Woodward B" for charcoal; for terne plates, "West Virginia A," "West Virginia B," and "West Virginia Old Style." (Formerly operated by the La Belle Iron Works).

Laughlin Works, Martins Ferry, Belmont county, Ohio. Tinning plant added to rolling mill in 1895 and enlarged in 1896-7 and in 1900; first tin and terne plates made August 29, 1895; 42 sets for tin and terne plates; weekly capacity, 20,000 boxes. Fuel, coal. Brand, "Laughlin." (Formerly operated by the Laughlin Nail Company).

Monongahela Works, South Fifteenth st., Pittsburgh, Allegheny county, Pa. Built in 1893; first terne plates made June 1 and first tinplates November 15, 1893; 22 sets for tin and terne plates; weekly capacity, 11,000 boxes. Fuel, coal. Brands: for coke tinplates, "Monon" and "Oliver (O. H.);"

for terne plates, "Iron City," "Soho," "Manchester," and "Sheffield." (Formerly operated by the Monongahela Tin Plate Company.)

Morewood Works, Gas City, Grant county, Indiana. Built in 1893; first terne plates made in June and first tinplates in December, 1893; 18 sets for tin and terne plates; weekly capacity, 6,400 boxes. Fuel, natural gas. Brands: for tinplates, "R. H. J." for coke and "Jack," "Grace," and "Dorothy" for charcoal; for terne plates, "F. W. B.," (old style), "J. H. B.," and "P. T. L." (Formerly called the Gas City Tinplate Works and operated by The Morewood Company.)

Muskegon Works, Muskegon, Muskegon county, Michigan. Tinning plant added to rolling mill in 1900 and first tin and terne plates made August 4, 1900; 14 sets for tin and terne plates; weekly capacity, 5,500 boxes. Fuel, manufactured gas. Brand, "American." (Formerly operated by the Champion Iron and Steel Company.)

National Works, Monessen, Westmoreland county, Pa. Built in 1897-8 and first tin and terne plates made in March, 1898; 38 sets for tin and terne plates; weekly capacity, 20,000 boxes. Fuel, coal. (Formerly operated by the National Tin Plate Company of Pennsylvania.)

New Castle Works, New Castle, Lawrence county, Pa. Built in 1892-3 and first tin and terne plates made in November, 1893; 32 sets for tin and terne plates; weekly capacity, 16,000 boxes. Fuel, coal. Brands: for tinplates, "New Castle 'Palm' Coke" and "New Castle Coke" for coke plates; "New Castle Best Palm," "New Castle Palm," "New Castle Charcoal," and "Shenango" for charcoal plates; for terne plates, "New Castle Old Method," "Shenango," and "Juniata." (Formerly operated by the New Castle Steel and Tin Plate Company, Incorporated.)

Pennsylvania Works, New Kensington, Westmoreland county, Pa. Built in 1895 and first tin and terne plates made in April, 1895; 10 sets for tin and terne plates; weekly capacity, 5,000 boxes. Fuel, coal. Brands: for tinplates, "Melvin" and "Range" for charcoal and "B. G." and "Peconic" for coke; for terne plates, "Defender." (Formerly operated by the Pennsylvania Tin Plate Company.)

Pittsburgh Works, New Kensington, Westmoreland county, Pa. Built in 1891-2 and first terne plates made in February and first tinplates in October, 1892; 12 sets for tin and terne plates; weekly capacity, 5,000 boxes. Fuel, bituminous coal. Brands: for tinplates, "Opal" and "Onyx" for charcoal and "Alba," "Alba Extra," and "Lorna" for coke; for terne plates, "Kensington," "Amber," and "P. T. W. Old Fashion." (Formerly operated by the Pittsburgh Tin Plate Works.)

Reeves Works, Canal Dover, Tuscarawas county, Ohio Built in 1896 and first tin and terne plates made in 1896; 8 sets for tin and terne plates and 4 pots for continuous roofing plates; weekly capacity, 5,000 boxes. Fuel, bituminous coal. Brands: for tinplates, "Althea," "Carol," "New Cresta," "Rieka," and "Villette" for charcoal and "Ariel," "Delta," and "S. J. R." for coke; for terne plates, "Barto," "Crown Old Method," "Eminent Old Method," "Mingo," "Pencoyd," "Preble Extra," and "Sanatoga"; for continuous roofing, "Dover," "Dover Extra," and "Dover Old Method." (Formerly operated by The American Tin Plate Machine and Manufacturing Company.)

Shenango Works, New Castle, Lawrence county, Pa. Built in 1897-8 and first tin and terne plates made in July, 1899; 36 sets for tin and terne plates; weekly capacity, 24,000 boxes. Fuel, coal. (Works partly built by the Shenango Valley Steel Company and completed and started by the American Tin Plate Company.)

Star Works, foot of Twelfth st., Pittsburgh, Allegheny county, Pa. Built in 1895; 13 sets for tin and terne plates; weekly capacity, 6,000 boxes. Fuel, natural gas. Brand, "Star" coke tinplates. (Formerly operated by the Star Tin Plate Company.)

United States Works, Demmler (eighth ward, McKeesport), Allegheny county, Pa. Original works erected in 1874; first terne plates made in 1874 and first tinplates in 1876; manufacture stopped in 1878 and resumed in 1890; new tin house built on modern plan in 1898; 14 sets for tin and terne plates; weekly capacity, 7,000 boxes. Fuel, natural gas. Brands: for tinplates, "U. S. Bright," "Youghiogheny Bright," and "Versailles Bright" for charcoal and "Mifflin"

for coke; for terne plates, "U. S. Monongahela," "U. S. Eagle," "U. S. Redipped," "U. S. Grant," and "Demmler Redipped." (Formerly operated by the United States Iron and Tin Plate Manufacturing Company.)

Total weekly capacity of the 25 completed tin and terne plate works, on double turn: 220,900 boxes of 100 pounds; of the building works, 6,000 boxes.

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AMERICAN STEEL HOOP COMPANY.

PRACTICALLY ALL THE STOCK OF THE AMERICAN STEEL HOOP COMPANY IS NOW OWNED BY THE UNITED STATES STEEL CORPORATION.

American Steel Hoop Company; general offices, Carnegie Building, Pittsburgh, Pa. Branch sales offices: Equitable Building, Atlanta, Georgia; No. 125 Milk st., Boston, Massachusetts; No. 451 Main street, Buffalo, New York; Rookery Building, Chicago, Illinois; No. 104 West Fourth St., Cincinnati, Ohio; No. 103 Superior st., Cleveland, Ohio; People's Bank Building, Denver, Colorado; Union Trust Building, Detroit, Michigan; Guaranty Building, Minneapolis, Minn.; Empire Building, New York City; Harrison Building, Philadelphia; No. 721 Olive st., St. Louis, Missouri; and No. 258 Market st., San Francisco, California. *Foreign*: Bell Telephone Building, Montreal, Canada; Apartado No. 924, City of Mexico, Mexico; and Nos. 71-72 King William St., London, England. *Officers*: W. E. Corey, President; H. P. Bope, First Vice-President and General Manager of Sales; W. W. Blackburn, Second Vice-President and Secretary; W. C. McCausland, Treasurer; James J. Campbell, Assistant Secretary and Auditor; and William R. Conrad, Assistant Treasurer. Capital stock issued, $33,000,000, of which $14,000,000 is 7 per cent. preferred and $19,000,000 is common. The company operates or controls the following works:

BLAST FURNACES—3.

Isabella Furnaces, (operated by The Isabella Furnace Company, Incorporated), Etna, Allegheny county, Pennsylvania. Three stacks: two built in 1872 and one built in 1890; No. 1, now 75 x 20, to be rebuilt to 20 x 90 and to be equipped with four Kennedy stoves; No. 2, 19 x 90, rebuilt in 1900, has four Kennedy stoves; No. 3, now being rebuilt, to be 20 x 90, and to be equipped with four Kennedy stoves. Fuel, coke; ore, Lake Superior; product, Bessemer, foundry, mill, and basic pig iron; total annual capacity, 500,000 gross tons. Brand, "Isabella." Equipped with one pig-iron casting machine.—*Active in 1901.*

Total annual capacity of the 3 furnaces: 500,000 gross tons.

ROLLING MILLS AND STEEL WORKS—14.

Atlanta Mill, Atlanta, Fulton county, Georgia. Built in 1900 and first put in operation in July, 1900; one heating furnace and one 8-inch train of rolls; product, hoops and cotton-ties; annual capacity, 15,000 gross tons. Fuel, coal. Brand, "*Ashco.*" J. P. McCaslin, Superintendent. (Formerly operated by the Southern Manufacturing Company).

Bridgeport Mill, Bridgeport, Belmont county, Ohio. Built in 1873 and put in operation January 1, 1874; enlarged in 1883 and 1891; 2 regenerative gas heating furnaces and one 16-inch 3-high bar mill; product, steel bars, light T rails, angles, tees, channels, and miscellaneous shapes; annual capacity, 30,000 gross tons. Fuel, natural gas. Brand, "*Ashco.*" George W. Bradberry, Superintendent. (Formerly operated by the Aetna-Standard Iron and Steel Company).

Clark Mill, Thirty-fifth st., A. V. Railway, and Allegheny river, Pittsburgh, Allegheny county, Pa. Built in 1869; 7 heating furnaces and 6 trains of rolls (two 8, one 9, one 10, one 12, and one 20-inch); two 12-gross-ton acid open-hearth steel furnaces added in 1889-90 with an annual capacity of 10,000 gross tons of ingots; product, hoop, band, box, and scroll steel, cotton-ties, steel tire, and skelp; annual capacity, 60,000 gross tons. Fuel, natural and manufactured gas. Brands, "Delta" for cotton-ties and "*Ashco.*" for other

products. W. H. Thompson, Superintendent. (Formerly called the Solar Steel Works and operated by the William Clark Sons Company).

Girard Mill, Girard, Trumbull county, Ohio. Built in 1872 and put in operation September 1, 1873; 23 single and 2 double puddling furnaces, 3 regenerative gas heating furnaces, and 4 trains of rolls (20-inch muck and 7, 8, and 10-inch finishing); product, all sizes of iron and steel bars, small steel T rails, angles, channels, tees, and special shapes; special attention given to the manufacture of iron for chains, bolts, nuts, and agricultural implements; annual capacity, 35,000 gross tons. Fuel, manufactured gas for heating furnaces and coal for puddling furnaces. Brand, "*Asheo.*" W. W. Wilson, Superintendent. (Formerly operated by The Union Iron and Steel Company).

Greenville Mill, Greenville, Mercer county, Pa. Built in 1871; 30 single puddling and 4 heating furnaces and 3 trains of rolls (one 16-inch muck and one 8 and one 10-inch finishing); product, iron and steel bars and skelp; special attention given to cold pressed nut iron; annual capacity, 25,000 gross tons. Brand, "*Asheo.*" Fuel, coal. Thomas R. Smith, Superintendent. (Formerly called the Greenville Rolling Mill and operated by The P. L. Kimberly Company).

Lower Union Mill, Youngstown, Mahoning county, Ohio. Built in 1863, 1874, and 1890; 10 single and 18 double puddling furnaces, 9 heating furnaces, (4 using producer gas), and 8 trains of rolls (two muck, and one 7, three 8, one 10, and one 16-inch finishing); product, hoops, bands, horseshoe iron, bar iron, guide iron, shapes, merchant steel bars, and steel cotton-ties; annual capacity, 125,000 gross tons. Fuel, coal and manufactured gas. Brands, "Eagle" for horseshoe iron and "*Asheo.*" for other products. M. E. Coombs, Superintendent. (Formerly operated by The Union Iron and Steel Company).

McCutcheon Mill, 88 Rebecca st., Allegheny, Allegheny county, Pa. Built in 1862; 20 single puddling and 4 heating furnaces and 4 trains of rolls (one muck, and two 8 and one 10-inch finishing); product, hoops, bands, horseshoe bars, and cotton-ties; also strap and T hinges, wrought steel shelf brackets, and wrought steel and iron washers; annual capa-

city, 40,000 gross tons. Fuel, natural gas and coal. Brands, "Star" for horseshoe bars and "*Ashco.*" for other products. F. B. Baugh, Superintendent. (Formerly called the Star Iron and Steel Works and operated by Lindsay & McCutcheon).

Mingo Mill, Mingo Junction, Jefferson county, Ohio. Formed by the consolidation of the Junction Iron Company and the Laughlin and Junction Steel Company in September, 1894. Original plant (formerly operated by the Junction Iron Company) built in 1882 and put in operation November 1, 1882; remodeled in 1895; now consists of 2 gas heating furnaces and one 10-inch continuous Belgian mill; product, merchant steel bars; annual capacity, 50,000 gross tons. Fuel, manufactured gas. Brand, "*Ashco.*" H. K. Williams, Superintendent. (Formerly called the Junction Works and operated by the Aetna-Standard Iron and Steel Company).

Monessen Mill, Monessen, Westmoreland county, Pa. Built in 1898-9 and first put in operation March 24, 1899; 2 continuous charging gas heating furnaces and 2 trains of rolls (one 8 and one 10-inch); product, steel hoops, bands, and cotton-ties; annual capacity, 40,000 gross tons. Brand, "*Ashco.*" Fuel, manufactured gas. A. B. Scott, Superintendent. (Formerly operated by the Monessen Steel Company).

Painter Mill, South Side, Pittsburgh, Allegheny county, Pa. Built in 1834; 9 regenerative gas heating furnaces and 8 trains of rolls (five 8, one 9, one 10, and one compound 16-inch); product, principally oil, whisky, and trunk hoops; also hoops for pails, tubs, and wooden ware, cotton-ties, lock-steel, stone saws, merchant bands, skelp, and hinge steel; annual capacity, 100,000 gross tons. Fuel, natural gas, producer gas, and coal. Brand, "*Ashco.*" T. L. Harper, Superintendent. (Formerly called the Pittsburgh Iron and Steel Works and operated by the J. Painter and Sons Company).

Pomeroy Mill, Pomeroy, Meigs county, Ohio. Built in 1847; 12 single puddling furnaces, 4 heating furnaces, and 4 trains of rolls (one muck, and one 7, one 8, and one 12-inch finishing); product, refined iron and soft steel bars, bands, and horseshoe bars; annual capacity, 20,000 gross tons. Fuel, coal. Brand, "*Ashco.*" H. A. Zellers, Superintendent.

(Formerly operated by the Pomeroy Iron and Steel Company).

Portage Mill, Duncansville, Blair county, Pa. Built in 1839 and rebuilt in 1882-3; enlarged in 1890 and 1897; 37 single puddling furnaces, 3 coal and 2 gas heating furnaces, and 6 trains of rolls (one 18 and one 20-inch muck, one 15-inch bar, and one 7, one 8, and one 10-inch guide); product, merchant bars; annual capacity, 30,000 gross tons. Fuel, producer gas and coal. Brands, "Portage" and "Ashco." (Formerly operated by the Portage Iron Company, Limited).

Upper Union Mill, Youngstown, Mahoning county, Ohio. Built in 1871 and burned and rebuilt in 1877; 5 gas heating furnaces, and one 7 and one 8-inch continuous, one 10-inch continuous hoop, and one 12-inch finishing train of rolls; product, bar, hoop, band, hame, box, tongue-cap, and tire steel, angles, special shapes, and cotton-ties; annual capacity, 125,000 gross tons. Fuel, coal and manufactured gas. Brand, "Ashco." M. E. Coombs, Superintendent. (Formerly operated by The Union Iron and Steel Company).

Warren Mill, Warren, Trumbull county, Ohio. Built in 1870, burned in 1878, and rebuilt in 1879; 20 single and 4 double puddling furnaces, 2 regenerative gas and 3 coal heating furnaces, and 3 trains of rolls (20-inch muck and 10 and 20-inch finishing); product, bar and skelp iron, shafting, etc.; annual capacity, 35,000 gross tons. Fuel, coal. Brand, "Ashco." J. M. Bennington, Superintendent. (Formerly operated by The Union Iron and Steel Company).

Total annual capacity of the 14 rolling mills and steel works: Open-hearth steel ingots, 10,000 gross tons; rolled products, 730,000 tons.

Coal Lands, Iron-Ore Mines, and Coke Ovens.

The company owns 530 acres of coal lands in Fayette and Westmoreland counties, Pa., 250 coke ovens at Cokeville, Westmoreland county, Pa., and a one-third interest in the National Mining Company, which owns about 7,000 acres of coal lands located within 15 miles of Pittsburgh. It has also acquired a one-fifth interest in the iron-ore property of the Mahoning Ore and Steel Company, whose mines are located in the Mesabi Range of the Lake Superior iron-ore region.

The company also owns a one-half interest in the Union Ore Company, which operates the Union Mine in the Mesabi Range.

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THE AMERICAN SHEET STEEL COMPANY.

Practically all the stock of The American Sheet Steel Company is now owned by The United States Steel Corporation.

The American Sheet Steel Company; general offices, Battery Park Building, New York City; branch offices: Vandergrift Building, Pittsburgh; Neave Building, Cincinnati; Land Title Building, Philadelphia; Security Building, St. Louis; Marquette Bulding, Chicago; Hennen Building, New Orleans; Chamber of Commerce Building, Detroit; Los Angeles, California; Portland, Oregon; Chattanooga, Tennessee; and 1622 Arapaho street, Denver, Colorado. *Officers*: George G. McMurtry, President; Wallace P. Bache, Assistant to the President; J. A. Topping, Vice-President; H. B. Wheeler, Secretary; F. S. Wheeler, Treasurer; J. Warner, Manager Aetna-Standard, Cambridge, Canton, Chartiers, Dennison, Dresden, Falcon, Midland, New Philadelphia, Old Meadow, Piqua, Reeves, Scottdale, and Struthers Works; E. W. Pargny, Manager Apollo, Hyde Park, Kirkpatrick, Saltsburg, and Vandergrift Works; Persifor F. Smith, Manager McKeesport and Wellsville Works. *Sales Manager*: James L. Sharkey, Battery Park Building, New York City. *District Sales Agents*: W. J. Wetstein, Security Building, St. Louis, Missouri; W. E. Stockton, Marquette Building, Chicago, Illinois; S. J. Waterman, Neave Building, Cincinnati, Ohio; Lee Chamberlain, Los Angeles, California; Hoge & Swift, Portland, Oregon; T. W. Simpers, Land Title Building, Philadelphia, Pa.; S. L. Mitchel, Hennen Building, New Orleans, Louisiana; W. T. Shannon, Chattanooga, Tennessee; F. A. Goodrich & Co., Chamber of Commerce Building, Detroit, Mich.; L. A. Hastings, 1622 Arapaho street, Denver, Colorado; and F. C. Milliken, Vandergrift Building, Pittsburgh. *Board of Directors*: George

G. McMurtry, W. T. Graham, William B. Leeds, D. G. Reid, J. A. Topping, Charles M. Schwab, E. H. Gary, J. Warner, Wallace P. Bache, T. M. Day, Jr., and F. S. Wheeler. *Executive Committee*: Charles M. Schwab, George G. McMurtry, Wallace P. Bache, John A. Topping, D. G. Reid, William B. Leeds, and W. T. Graham. Capital stock authorized, $52,000,000, of which $26,000,000 is preferred and $26,000,000 is common. Stock issued, $24,500,000 of common and $24,500,000 of preferred; total, $49,000,000. The company operates the following works:

ROLLING MILLS AND STEEL WORKS—21.

Aetna-Standard Works, Bridgeport, Belmont county, Ohio. Built in 1872 and since enlarged; 4 regenerative gas heating furnaces, 20 pair and 20 sheet furnaces, 24 box annealing furnaces, two 60-inch, three 38-inch, fourteen 26-inch, and three 24-inch hot mills, and four 22 inch cold mills; product, black sheets and painted and formed roofing; annual capacity, triple turn, 88,400 net tons of sheets. Fuel, natural gas and coal. A galvanizing plant, not now in operation, is connected with the works. H. L. Cooke, Division Superintendent. (Formerly called the Aetna Works, the Standard Sheet Mill Works, and the Standard Black Plate Mills, and operated by the Aetna-Standard Iron and Steel Company as three separate works; the three plants have been consolidated and are now known as the Aetna-Standard Works.)

Apollo Works, Apollo, Armstrong county, Pa. Built in 1850 and rebuilt in 1886; 12 heating and 9 annealing furnaces, 1 muck and bar train, one 22-inch and five 24-inch hot sheet mills, and two 24-inch cold mills. Two 20-gross-ton acid open-hearth steel furnaces; first steel made June 15, 1886; annual capacity, 33,000 gross tons of ingots. Product, black sheets for galvanizing; annual capacity, triple turn, 18,000 net tons. Fuel, natural gas exclusively. S. A. Davis, Division Superintendent. (Formerly called the Apollo Rolling Mills and operated by the Apollo Iron and Steel Company.)

Cambridge Works, Cambridge, Guernsey county, Ohio. Built in 1889-90 and put in operation in July, 1890; 3 scrap furnaces, 2 gas and 19 coal heating furnaces, and one 22-inch muck mill, one 24 x 48-inch, three 24 x 33-inch, and three 24 x

38-inch sheet mills, and one 24 x 44-inch, one 24 x 48-inch, and one 24 x 50-inch cold mills; product, sheet bars and sheet iron and sheet steel; annual capacity, triple turn, 5,000 gross tons of sheet bars and 20,000 net tons of sheet iron and sheet steel. Fuel, producer gas for bar mill and natural gas for sheet mill. Brand for galvanized sheets, "Apollo Cambridge Works." Also operate a galvanizing plant with an annual capacity of 22,000 net tons. H. L. Cooke, Division Superintendent. (Formerly operated by The Cambridge Iron and Steel Company.)

Canton Works, Canton, Stark county, Ohio. Built in 1894 and first put in operation in August, 1894; 5 pair, 5 sheet, and 5 annealing furnaces, two 24 x 36-inch and three 24 x 40-inch hot mills, and two 24 x 44-inch cold mills; product, iron and steel black sheets for stamping and roofing; annual capacity, triple turn, 14,000 net tons. Fuel, natural gas and coal. Adding one 38 x 26-inch hot sheet mill. E. E. Cline, Division Superintendent. (Formerly operated by the Canton Rolling Mill Company.)

Chartiers Works, Carnegie, Allegheny county, Pa. Built in 1883-4 and put in operation August 13, 1884; 4 single puddling furnaces, 11 heating furnaces, one 4-ton hammer, one 20 x 64-inch bar mill, one 22 x 32-inch, one 24 x 38-inch, and one 24 x 48-inch hot sheet mills, and one 24 x 40-inch and one 24 x 50-inch cold mills; product, sheet iron and sheet steel; annual capacity, triple turn, 7,200 net tons. Fuel, natural gas and coal. John Henry, Superintendent. (Formerly operated by The Chartiers Iron and Steel Company, Limited.)

Dennison Works, Dennison, Tuscarawas county, Ohio. Built in 1897 and first put in operation November 10, 1897; 4 heating furnaces, 4 annealing furnaces, two 24 x 40-inch and two 26 x 32-inch hot sheet mills, and one 22 x 44-inch, one 22 x 38-inch, and one 22 x 32-inch cold mills; product, common cold-rolled sheets for stamping and black plates for tinning; annual capacity, triple turn, 11,200 net tons. Fuel, bituminous coal. E. E. Cline, Division Superintendent. (Formerly operated by The Dennison Rolling Mill Company.)

Dresden Works, Dresden, Muskingum county, Ohio. Built and put in operation in 1898; 4 sheet furnaces, 4 pair furnaces, 2 double annealing furnaces, one 24 x 33-inch, one

25 x 48-inch, and two 24 x 38-inch hot sheet mills, and one 25 x 48-inch cold mill; product, iron and steel sheets; annual capacity, triple turn, 11,200 net tons. Fuel, coal. E. E. Cline, Division Superintendent. (Formerly operated by The Dresden Iron and Steel Sheet Company.)

Falcon Works, Niles, Trumbull county, Ohio. Built in 1867; 15 single and 4 double puddling furnaces, 13 heating furnaces, 1 scrap furnace, 11 box annealing furnaces, one 20-inch skelp mill, one 22-inch sheet bar mill, one 22-inch muck mill, one 26-inch and three 24-inch hot sheet mills, four 22-inch cold mills, and one 3-ton hammer; product, muck bar and sheet iron and sheet steel; annual capacity, triple turn, 23,000 gross tons of muck bar and 11,200 net tons of sheet iron and sheet steel. Fuel, bituminous coal and slack. E. E. Cline, Division Superintendent, and Joseph Beck, Superintendent. (Formerly called the Falcon Iron and Nail Works and operated by the Falcon Iron and Nail Company.)

Hyde Park Works, Hyde Park, Westmoreland county, Pa. Built in 1895 and first put in operation September 1, 1895; 4 Bailey combination sheet and pair furnaces, one single sheet furnace, one single pair furnace, one billet heating furnace, 7 annealing furnaces, one sheet bar mill, 3 roughing mills, (two 40-inch and one 44-inch,) 5 hot sheet mills, (one 38-inch three 40-inch, and one 44-inch,) and one 48-inch and one 50-inch cold mills; product, sheet bars and fine grades of soft steel sheets for stamping, japanning, tinning, galvanizing, and armatures, including pickled and cold rolled, open pickled double annealed and cold rolled, and cold rolled and annealed finishes; annual capacity, triple turn, 10,000 gross tons of sheet bars and 14,000 net tons of sheets. Fuel, natural gas. S. A. Davis, Division Superintendent. (Formerly called the Hyde Park Iron and Steel Works and operated by the Hyde Park Iron and Steel Company.)

Kirkpatrick Works, Leechburg, Armstrong county, Pa. Built in 1872; 18 heating furnaces, nine 24-inch sheet mills, and two 24-inch cold mills; product, steel sheets; annual capacity, triple turn, 24,000 net tons. Fuel, natural gas and coal. S. A. Davis, Division Superintendent. (Formerly called the Leechburg Iron Works and operated by Kirkpatrick & Co., Limited.)

McKeesport Works, McKeesport, Allegheny county, Pa. Built in 1851; 14 forge fires, 8 single puddling furnaces, 2 refinery fires; 18 annealing furnaces, 31 heating furnaces, three 20-inch bar mills, 16 sheet mills, (two 24 x 40, two 24 x 48, six 20 x 40, three 20 x 36, two 24 x 56, and one 24 x 60-inch,) two 24 x 40 and two 20 x 36-inch cold mills, and 8 hammers; open-hearth steel department, built in 1889-90, contains two 15-gross-ton acid open-hearth steel furnaces; product, muck bar and sheet iron and sheet steel, both black and planished; specialty, patent planished sheet iron; annual capacity, triple turn, 18,000 gross tons of ingots, 6,500 gross tons of muck bar, and 33,600 net tons of sheets. Fuel, natural gas, manufactured gas, and coal. Charcoal refinery fires for the manufacture of blooms are connected with the works; 14 knobbling fires; annual capacity of blooms, 8,400 gross tons. Trademark, a Russian bear in the talons of an American Eagle. S. M. Cooper, Superintendent. (Formerly called the McKeesport Iron Works and operated by the W. Dewees Wood Company.)

Midland Works, Muncie, Delaware county, Indiana. Built in 1892 and first put in operation October 10, 1892; one 30-gross-ton basic and one 30-gross-ton acid open-hearth steel furnace with an annual capacity of 40,000 gross tons of ingots; 6 pair, 6 sheet, and 6 annealing furnaces, 4 soaking pits, one 30-inch reversing blooming mill, one 3-high bar mill, one 26-inch plate mill, six 24-inch sheet mills, and five 24-inch cold mills; product, ingots, blooms, billets, slabs, sheet and tinplate bars, and stamping and tinning sheets; annual capacity, triple turn, 40,000 gross tons of billets and sheet and tinplate bars and 22,800 net tons of sheets and plates. Fuel, natural gas exclusively. A. Beard, Superintendent. (Formerly operated by the Midland Steel Company.)

New Philadelphia Works, New Philadelphia, Tuscarawas county, Ohio. Built in 1883; one gas and 7 coal heating furnaces, 2 muck mills, one 48-inch, two 34-inch, and six 38-inch hot sheet mills, and one 44-inch and one 50-inch cold mills; product, common and refined sheet iron and sheet steel; annual capacity, triple turn, 31,200 net tons. Fuel, coal. E. E. Cline, Division Superintendent. (Formerly operated by The New Philadelphia Iron and Steel Company.)

Old Meadow Works, Scottdale, Westmoreland county, Pa. Built and put in operation in 1898; 6 sheet furnaces, 6 pair furnaces, 5 annealing furnaces, 6 sheet mills, (one 26 x 54-inch, one 24 x 44-inch with roughing rolls, and four 24 x 38-inch with roughing rolls, all hot,) and 2 cold mills; product, sheet iron; annual capacity, triple turn, 17,000 net tons. Fuel, natural gas and coal. Robert Skemp, Division Superintendent. (Formerly operated by the Old Meadow Rolling Mill Company.)

Piqua Works, Piqua, Miami county, Ohio. Built in 1889; 6 single puddling furnaces, 2 sheet bar heating furnaces, 4 combined pair and softening furnaces, 5 annealing furnaces, one 23 x 78-inch bar mill, one 24 x 34, one 24 x 36, one 24 x 40, and one 24 x 48-inch hot sheet mills, and one 22 x 42-inch cold sheet mill; product, sheet bars and iron and steel sheets; annual capacity, triple turn, 5,000 gross tons of sheet bars and 12,400 net tons of sheets. Fuel, natural gas and coal. A galvanizing plant, with an annual capacity of 6,500 net tons, is connected with the works. J. H. Frantz, Superintendent. (Formerly operated by The Piqua Rolling Mill Company.)

Reeves Works, Canal Dover, Tuscarawas County, Ohio. Built in 1865-6 and enlarged in 1895; first iron rolled in February, 1866; four 26 x 34, one 26 x 44, one 26 x 60, and four 26 x 38-inch hot sheet mills, and one 24 x 60 and four 24 x 48-inch cold mills; also a complete galvanizing and pickling plant; product, black and galvanized and cold-rolled sheet iron and sheet steel; annual capacity, triple turn, 32,200 net tons of black sheets and 22,000 net tons of galvanized sheets. Fuel, coal. E. E. Cline, Division Superintendent. (Formerly operated by The Reeves Iron Company.)

Saltsburg Works, Saltsburg, Indiana county, Pa. Built in 1894-5 and first put in operation July 1, 1895; 8 heating furnaces, 4 double annealing furnaces, 2 trains of roughing rolls, one 48 and three 38-inch trains of finishing rolls, and two 48-inch trains of cold rolls; product, fine sheet iron; annual capacity, triple turn, 12,000 net tons. Fuel, natural gas and coal. S. A. Davis, District Superintendent. (Formerly called the Saltsburg Rolling Mills and operated by P. H. Laufman & Co., Limited.)

Scottdale Works, Scottdale, Westmoreland county, Pa.

Built in 1873 and remodeled in 1894 and in 1897; 8 sheet and 8 pair heating furnaces, 7 box annealing furnaces, 8 sheet mills, (two 24 x 44, four 22 x 40, and two 22 x 38-inch,) and 3 cold mills (one 22 x 44, one 22 x 40, and one 22 x 38-inch); product, iron and steel sheets; annual capacity, triple turn, 24,060 net tons. Fuel, natural gas, coal, and coke. A galvanizing plant, with an annual capacity of 15,000 net tons, is connected with the works. Robert Skemp, Division Superintendent. (Formerly operated by the Scottdale Iron and Steel Company, Limited.)

Struthers Works, Struthers, Mahoning county, Ohio. Built in 1881-2 and entirely rebuilt in 1895; partly destroyed by fire on August 12, 1899, but immediately rebuilt; 6 pair and 6 sheet furnaces, 8 large box annealing furnaces, and 8 sheet mills (six 26 x 40-inch hot and two 22 x 40-inch cold); product, all sizes of iron and steel sheets; annual capacity, triple turn, 16,800 net tons. Fuel, coal, coke, and slack. Adding one 38 x 26-inch hot sheet mill. Charles S. Thomas, Superintendent. (Formerly operated by The Struthers Iron and Steel Company.)

Vandergrift Steel Works, Vandergrift, Westmoreland county, Pa. Built in 1895-6 and first put in partial operation in October, 1895; 4 four-hole Siemens regenerative gas heating furnaces, one 2-high reversing blooming mill, one continuous bar mill containing 2 groups of 3 pairs of rolls each, twenty-nine double 26-inch sheet mills, ten 24-inch cold mills, and 43 heating furnaces; four 30-gross-ton acid and two 30-gross-ton basic open-hearth steel furnaces; first open-hearth steel made January 11, 1897; product, black and galvanized sheets, acid and basic open-hearth steel ingots, and sheet bars; annual capacity, triple turn, 156,000 gross tons of ingots, 132,650 gross tons of sheet bars, 92,000 net tons of black sheets, and 94,500 net tons of galvanized sheets. Fuel, natural gas, coal, and producer gas. Brand, "Apollo." S. A. Davis, Division Superintendent. (Formerly called the Apollo Steel Works and operated by the Apollo Iron and Steel Company.)

Wellsville Works, Wellsville, Columbiana county, Ohio. Mill built in 1873 to make tinplates; remodeled in 1880; 1 heating furnace, 13 pair and sheet furnaces, and 17 anneal-

ing furnaces, one bar mill, 6 roughing mills, six 24-inch hot sheet mills, and one 20, one 22, and seven 24-inch cold mills; product, plate and sheet iron and steel; annual capacity, triple turn, 16,800 net tons. Fuel, natural gas. D. S. Brookman, Superintendent. (Formerly operated by the Wellsville Plate and Sheet Iron Company.)

Total annual capacity of the 21 rolling mills and steel works: Open-hearth ingots, 247,000 gross tons; charcoal blooms, 8,400 gross tons; muck bar, 29,500 gross tons; plain and black sheets, 530,000 net tons; galvanized sheets, 160,000 net tons; and large and small sheet bars, 192,650 gross tons.

Coal Lands.

The company owns 2,056 acres of coal lands, located in Armstrong and Westmoreland counties in Pennsylvania, and in Tuscarawas and Belmont counties in Ohio.

THE AMERICAN BRIDGE COMPANY.

Practically all the stock of The American Bridge Company is now owned by the United States Steel Corporation.

American Bridge Company, (of New Jersey,) (Manufacturing Company); main office, No. 1 Exchange Place, Jersey City, New Jersey; purchasing office, No. 261 South Fourth st., Philadelphia. *Officers:* Alfred J. Major, President; William H. McCord, Vice-President, in charge of Finance; Joshua A. Hatfield, Vice-President, in charge of Contracting; C. C. Schneider, Vice-President, in charge of Engineering; Paul L. Wolfel, Chief Engineer; James Christie, Mechanical Engineer; C. C. Price, Auditor; William H. Connell, Treasurer; and H. Schoonmaker, Secretary. *Board of Directors:* Alfred J. Major, Percival Roberts, Jr., James Christie, August Ziesing, Paul L. Wolfel, Robert J. Davis, A. L. Schultz, E. A. Muench, Abram S. Hewitt, Charles M. Schwab, and Elbert H. Gary.

American Bridge Company of New York (Selling and Erecting Company); offices in New York State: 100 Broad-

way and 7 West Twenty-second st., New York City, and Ellicott Square Building, Buffalo, New York. *Officers*: Joshua A. Hatfield, President, C. C. Schneider, Vice-President, William H. Connell, Treasurer, and H. Schoonmaker, Secretary, all at 100 Broadway, New York City; August Ziesing, Vice-President, Chicago; S. P. Mitchell, Chief Engineer, and C. C. Price, Auditor, Pencoyd, Pa. *Board of Directors:* Joshua A. Hatfield, A. J. Major, Percival Roberts, Jr., C. C. Schneider, James A. Huston, August Ziesing, J. P. Kennedy, E. A. Muench, C. W. Bryan, C. M. Schwab, and S. P. Mitchell. *Branch offices in the United States:* Fiske Building, 89 State st., Boston, Massachusetts; 42 Church st., New Haven, Connecticut; 261 South Fourth st., Philadelphia; Continental Trust Building, Baltimore, Maryland; Empire Building, Pittsburgh, Pa.; Chamber of Commerce Building, Cleveland, Ohio; Monadnock Block, Chicago, Illinois; Second st. and Sixth ave., Minneapolis, Minn.; Godchaux Building, New Orleans, Louisiana; Massachusetts Building, Kansas City, Missouri; Hennessey Building, Butte, Montana; Jackson Block, Denver, Colorado; Dooley Block, Salt Lake City, Utah; 116 West Michigan st., Duluth, Minn.; Crocker Building, San Francisco, California; Bailey Building, Seattle, State of Washington; English-American Building, Atlanta, Georgia; and the Perin Building, Cincinnati, Ohio. *Foreign offices:* Place Viger Hotel, Montreal, Quebec, Canada; 2 Calle de Gante, City of Mexico, Mexico; P. O. Box 334, Guadalajara, Mexico; 110 Cannon st., London, E. C., England; 11 Mercaderes, Havana, Cuba; 20 Loftus st., Sydney, New South Wales; 43 Sakamoto cho, Nihombashi-ku, Tokio, Japan; 69 Shichome, Honcho, Yokohama, Japan; 17 Nichome Nakanoshima, Osaka, Japan; 3 Sanchome Kaigandoxi, Kobe, Japan; 3118 Honcho, Moji, Japan; 3 Oura, Kaigan, Nagasaki, Japan; 12 Mingdong, Seoul, Corea; Japanese Settlement, Chemulpo, Corea; French Settlement, Tientsin, China; 17 Szechuen Road, English Settlement, Shanghai, China; and 6 Ice House st., Praya Central, Hong Kong, China.

Capital stock of American Bridge Company (of New Jersey), $70,000,000, of which $35,000,000 is 7 per cent. cumulative preferred and $35,000,000 is common. Capital stock of American Bridge Company of New York, $100,000. The

American Bridge Company, (of New Jersey,) operates or controls the following works:

ROLLING MILLS AND STEEL WORKS—1.

Pencoyd Iron Works, A. and P. Roberts Company, operators, general office, 261 South Fourth st., Philadelphia. Works in Montgomery county, opposite Manayunk, Pa. Built in 1852; 11 regenerative gas heating furnaces, 3 coal-fired heating furnaces, and 5 trains of rolls, (one 12, two 23, one 28, and one 2-high 36-inch reversing.) Steel department, added in 1887 and since enlarged, contains one 75-gross-ton and ten 30-gross-ton basic open-hearth furnaces; annual capacity, 230,000 gross tons of ingots. Product, open-hearth steel channel bars from 2 to 15 inches, beams from 3 to 24 inches, deck beams from 5 to 12 inches, tees from 1 to 6 inches, angles from 1 to 8 inches, flats from 1 to 14 inches wide, rounds from ½ inch to 7 inches in diameter, hammered or rolled axles, bar and bridge steel, shafting, and steel blooms; annual capacity, 180,000 gross tons of finished material. Specialties, structural shapes, shafting, and bar and bridge steel. Brand, "Pencoyd." Fuel, bituminous coal.

Bridge and Construction Department contains equipment for all classes of bridge and architectural work; also standard railroad turntables; also hydraulic forge shop for the manufacture of solid forged steel eye-bars from 3 to 12 inches wide; annual capacity, 65,000 gross tons. Fuel, bituminous coal.

Officers: Charles Major, President, James Christie, Vice-President, and J. W. Davis, Secretary and Treasurer, 261 South Fourth st., Philadelphia. For sales offices see list of branch offices of American Bridge Company of New York.

Total annual capacity of the rolling mills and steel works: Open-hearth steel ingots, 230,000 gross tons; finished products, 180,000 tons; of the bridge and construction works, 65,000 gross tons.

BRIDGEBUILDING PLANTS—25.

American Bridge Works, Fortieth st. and Stewart ave., Chicago, Illinois. Railroad and highway bridges. Also erect

steel buildings. Annual capacity, 32,500 gross tons. (Formerly operated by the American Bridge Works.)

Berlin Iron Bridge Works, East Berlin, Conn. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 10,800 gross tons. (Formerly operated by The Berlin Iron Bridge Company.)

Buffalo Bridge and Iron Works, Buffalo, New York. Railroad and highway bridges. Annual capacity, 4,000 gross tons. (Formerly operated by the Buffalo Bridge and Iron Works.)

Edge Moor Bridge Works, Edge Moor, Delaware. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 22,500 gross tons. (Formerly operated by the Edge Moor Bridge Works.)

Elmira Bridge Works, Elmira, New York. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 27,000 gross tons. (Formerly operated by the Elmira Bridge Company, Limited.)

Gillette-Herzog Manufacturing Works, 259 First avenue south, Minneapolis, Minnesota. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 10,800 gross tons. (Formerly operated by the Gillette-Herzog Manufacturing Company.)

Groton Bridge and Manufacturing Works, Groton, New York. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 7,200 gross tons. (Formerly operated by the Groton Bridge and Manufacturing Company.)

Hilton Bridge Works, North Albany, New York. Railroad and highway bridges. Annual capacity, 5,400 gross tons. (Formerly operated by the Hilton Bridge Construction Company.)

Horseheads Bridge Works, Horseheads, New York. Highway bridges; have erected a few railroad bridges. Annual capacity, 1,800 gross tons. (Formerly operated by the Horseheads Bridge Company.)

Keystone Bridge Works, Fifty-first st., Pittsburgh. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 32,500 gross tons. (Formerly operated by The Carnegie Steel Company, Limited.)

Lafayette Bridge Works, Lafayette, Indiana. Railroad

and highway bridges. Also erect steel buildings. Annual capacity, 2,700 gross tons. (Formerly operated by The Lafayette Bridge Company.)

Lassig Bridge and Iron Works, corner Clybourn and Wrightwood avenues, Lake View, Chicago, Illinois. Railroad bridges only. Also erect steel buildings. Annual capacity, 40,500 gross tons. (Formerly operated by the Lassig Bridge and Iron Works.)

Milwaukee Bridge and Iron Works, Seventeenth St. and St. Paul avenue, Milwaukee, Wisconsin. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 10,800 gross tons. (Formerly operated by The J. G. Wagner Company.)

New Columbus Bridge Works, Columbus, Ohio. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 3,600 gross tons. (Formerly operated by The New Columbus Bridge Company.)

Pencoyd Iron Works, (Bridge and Construction Department,) A. and P. Roberts Company, operators, 261 South Fourth st., Philadelphia. Works in Montgomery county, opposite Manayunk, Pa. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 65,000 gross tons.

Pittsburgh Bridge Works, Thirty-eighth st. and A. V. Ry., Pittsburgh, Pa. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 13,500 gross tons. (Formerly operated by The Pittsburgh Bridge Company.)

Post & McCord Works, Greenpoint, Long Island, New York. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 21,600 gross tons. (Formerly operated by Post & McCord.)

Rochester Bridge and Iron Works, Rochester, New York. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 4,500 gross tons. (Formerly operated by the Rochester Bridge and Iron Works.)

Schultz Bridge Iron Works, McKees Rocks, Pa. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 9,000 gross tons. (Formerly operated by the Schultz Bridge Iron Company.)

Shiffler Bridge Works, Forty-eighth st. and A. V. Ry., Pittsburgh, Pa. Railroad and highway bridges. Also erect

steel buildings. Annual capacity, 36,000 gross tons. (Formerly operated by the Shiffler Bridge Company.)

Toledo Bridge Works, Toledo, Ohio. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 25,000 gross tons. (Formerly operated by The Toledo Bridge Company.)

Trenton Iron Works, Trenton, New Jersey. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 27,000 gross tons. (Formerly operated by the New Jersey Steel and Iron Company.)

Union Bridge Works, Athens, Pa. Railroad bridges only. Annual capacity, 13,500 gross tons. (Formerly operated by the Union Bridge Company.)

Wrought Iron Bridge Works, South Canton, Ohio. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 5,000 gross tons. (Formerly operated by the Wrought Iron Bridge Company.)

Youngstown Bridge Works, Youngstown, Ohio. Railroad and highway bridges. Also erect steel buildings. Annual capacity, 9,000 gross tons. (Formerly operated by The Youngstown Bridge Company.)

Total annual capacity of the 25 bridge building plants: 441,200 gross tons.

BOLT, NUT, AND RIVET WORKS—5.

Edge Moor Bridge Works, Edge Moor, Delaware. Product, rivets, principally for their own use in the construction of bridges, buildings, etc. Sizes of rivets, from ⅝ of an inch to 1 inch. (Formerly operated by the Edge Moor Bridge Works.)

Elmira Bridge Works, Elmira, New York. Product, steel bolts, nuts, and rivets. Sizes: bolts, from ½ of an inch to 4 inches; nuts, 2 inches and larger; rivets, ½ of an inch and larger. (Formerly operated by the Elmira Bridge Company, Limited.)

Lassig Bridge and Iron Works, Chicago, Illinois. Product, steel bolts and rivets. Sizes: bolts from ⅝ of an inch to 2 inches in diameter; rivets, from ½ of an inch to 1 inch in diameter. (Formerly operated by the Lassig Bridge and Iron Works.)

Pencoyd Iron Works, A. and P. Roberts Company, operators, 261 South Fourth st., Philadelphia. Works in Montgomery county, opposite Manayunk, Pa. Product, steel bolts, upset rods, and eye bars for bridge and structural work; also steel rivets. Sizes; bolts, from $\frac{1}{2}$ of an inch to 7 inches in diameter; rivets, from $\frac{1}{2}$ of an inch to 2 inches in diameter.

Trenton Iron Works, Trenton, New Jersey. Product, steel bolts for their own use in the construction of bridges and buildings; also steel bridge rivets. Sizes of rivets, from $\frac{1}{2}$ of an inch to $1\frac{1}{4}$ inches inclusive. (Formerly operated by the New Jersey Steel and Iron Company.)

SHELBY STEEL TUBE COMPANY.

The majority of the stock of the Shelby Steel Tube Company is now owned by The United States Steel Corporation.

Shelby Steel Tube Company; general offices, American Trust Building, Cleveland, Ohio; Western office, The Rookery, Chicago, Illinois; Eastern office, 258 Broadway, New York City; European office and warehouse, 29 Constitution Hill, Birmingham, England. *Officers at Cleveland*: W. S. Miller, President; H. S. Smith, Assistant to the President; J. W. Phillips, Treasurer; H. H. Cockley, Secretary; A. C. Morse, General Superintendent; and J. A. Pannabaker, Purchasing Agent. *Officer at New York*: Frank L. Brown, General Sales Agent. *Officer at Chicago*: W. R. Garberson, Assistant General Sales Agent. Capital stock authorized, $15,000,000, of which $5,000,000 7 per cent. cumulative preferred and $8,151,500 common have been issued. The company operates the following works:

Rolling Mills—5.

Auburn Works, (Factory O.,) Auburn, Schuylkill county, Pennsylvania. Rolling mill added to bolt and nut works in 1897; first rolled blanks produced in 1897; 2 heating furnaces and 2 trains of rolls; product, blanks for seamless tubes; an-

nual capacity, 3,600 gross tons. Fuel, bituminous coal. (Formerly operated by the Auburn Bolt and Nut Works.)

Ellwood Works, (Factory B.,) Ellwood City, Lawrence county, Pa. Built in 1895 and first put in operation in June of that year; 2 heating furnaces, 1 piercing machine, and two 14½-inch trains of rolls; product, blanks for the manufacture of Seamless drawn steel tubes; annual capacity, 6,000 gross tons of blanks and about 12,000,000 feet of seamless drawn tubes. Fuel, coal. (Formerly operated by the Ellwood Weldless Tube Company.)

Greenville Works, (Factory C.,) Greenville, Mercer county, Pa. Built in 1896 and first put in operation in May, 1897; 3 forge fires, 2 heating furnaces, 1 piercing machine, 3 hammers, (two 150-lb. and one 250-lb.,) and 2 hot and 20 cold trains of rolls; product, blanks for the manufacture of seamless drawn steel tubes; annual capacity, 15,000 gross tons of blanks and 6,000,000 feet of seamless drawn tubes. Fuel, bituminous coal and coke. (Formerly operated by the Greenville Tube Company.)

Shelby Works, (Factory A.,) Shelby, Richland county, Ohio. Built in 1890 and first put in operation in July, 1891; 4 Swindell heating furnaces and 9 hot mills (one 10, four 12, and four 20-inch); product, blanks for the manufacture of seamless drawn steel tubes; annual capacity, 12,000 gross tons of blanks and 24,000,000 feet of seamless drawn steel tubes. Fuel, coal and oil. (Formerly operated by the Shelby Steel Tube Company.)

Toledo Works, (Factory D.,) Toledo, Lucas county, Ohio. Built in 1896; first rolled blanks produced in 1900; one heating furnace, one piercing machine, and 4 trains of rolls; product, rolled blanks for the manufacture of seamless drawn steel tubes; annual capacity, 8,000 gross tons. Fuel, gas. (Formerly operated by the American Weldless Steel Tube Company.)

Total annual capacity of the 5 rolling mills: 44,600 gross tons of blanks.

SEAMLESS DRAWN TUBE WORKS—7.

Albany Works, (Factory N.,) Albany, Delaware county, Indiana. Product, cold-drawn seamless steel tubes; sizes,

from $\frac{1}{4}$ of an inch in diameter to $1\frac{1}{2}$ inches; annual capacity, 5,000,000 feet. (Formerly operated by the Albany Manufacturing Company.)

Auburn Works, (Factory O.,) Auburn, Schuylkill county, Pa. Product, seamless steel tubes; sizes from $\frac{1}{8}$ of an inch in diameter to 2 inches; annual capacity, 3,000,000 feet. (Formerly operated by the Auburn Bolt and Nut Works.)

Ellwood Works, (Factory B.,) Ellwood City, Lawrence county, Pa. Product, cold-drawn seamless steel tubes; sizes, from 1/16 of an inch in diameter to $3\frac{1}{2}$ inches; annual capacity, about 12,000,000 feet. (Formerly operated by the Ellwood Weldless Tube Company.)

Greenville Works, (Factory C.,) Greenville, Mercer county, Pa. Product, cold-drawn seamless steel tubes; sizes, from $\frac{1}{8}$ of an inch in diameter to $4\frac{1}{8}$ inches; annual capacity, 6,000,000 feet. (Formerly operated by the Greenville Tube Company.)

Hartford Works, (Factory M.,) Hartford, Hartford county, Connecticut. Product, cold-drawn seamless steel tubes; sizes, 2 inches and under; annual capacity, 10,000,000 feet. (Formerly operated by The Pope Tube Company.)

Shelby Works, (Factory A.,) Shelby, Richland county, Ohio. Product, cold-drawn seamless steel tubes; sizes, from $\frac{1}{8}$ of an inch in diameter to $3\frac{1}{4}$ inches; also square, rectangular, and special sections; annual capacity, 24,000,000 feet. (Formerly operated by the Shelby Steel Tube Company.)

Toledo Works, (Factory D.,) Toledo, Lucas county, Ohio. Product, seamless drawn steel tubes; sizes, from $\frac{1}{8}$ of an inch in diameter to 6 inches; annual capacity, 3,000,000 feet. (Formerly operated by the American Weldless Steel Tube Company.)

Total annual capacity of the 7 seamless drawn tube works; 63,000,000 feet.

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LAKE SUPERIOR CONSOLIDATED IRON MINES.

Practically all the stock of the Lake Superior Consolidated Iron Mines is now owned by the United States Steel Corporation.

Lake Superior Consolidated Iron Mines; offices, 71 Broadway, New York City, and Duluth, Minnesota. *Officer at Chicago:* Charles P. Coffin, President. *Offices at New York:* Dwight H. Coble, Vice-President and Assistant Secretary, and Charles E. Scheide, Secretary and Treasurer. *Officers at Duluth:* Joseph B. Cotton, Attorney, and W. J. Olcott, Superintendent of Mines. *Sales Offices and Agents:* Oglebay, Norton & Co., and M. A. Hanna & Co., Cleveland, Ohio; also 71 Broadway, New York City. *Board of Directors:* James Gayley, Dwight H. Coble, Charles P. Coffin, Walter M. Jeffery, and Thomas F. Cole. Capital stock, $30,000,000, all common. The company owns the following iron-ore properties, which are included in the list of mines printed on pages 67-8.

Iron-Ore Mines.

The iron-ore properties of the company are all located in the Mesabi Range in the State of Minnesota. The active mines are as follows: Hull, Rust, Burt, Sellers, Pillsbury, Mountain Iron, Missabe Mountain, Ohio, Lone Jack, Minnewas, Stephens, Adams, Aetna, Cloquet, Spruce, Biwabik, Duluth, and Day. In addition the company owns large tracts of explored but unopened iron-ore lands on the Mesabi Range which are held in reserve for future use. The company also owns in fee several thousand acres of unexplored mineral lands in the Mesabi Range, much of which is located in the ore-bearing member.

Railroads.

The Lake Superior Consolidated Iron Mines own the entire capital stock of the Duluth, Missabe, and Northern Railway, which operates 220 miles of railroad.

PITTSBURGH STEAMSHIP COMPANY.

Five-sixths of the stock of the Pittsburgh Steamship Company is owned by The Carnegie Company and one-sixth of the stock by the United States Steel Corporation. Into the Pittsburgh Steamship Company have been merged all the steamship companies belonging to the constituent companies of The United States Steel Corporation, and it now operates all the steamships and barges belonging to the constituent companies of The United States Steel Corporation.

Pittsburgh Steamship Company; principal office, Duluth, Minnesota; branch office, Cleveland, Ohio. *Officers:* Daniel M. Clemson, President, Carnegie Building, Pittsburgh; A. B. Wolvin, Vice-President and General Manager, George D. Swift, Assistant Treasurer, and W. M. Jeffery, Auditor, Duluth; James H. Hoyt, Secretary, and Edwin S. Mills, Assistant General Manager, Cleveland; and Charles E. Scheide, Treasurer, 71 Broadway, New York City. *Board of Directors:* Daniel M. Clemson, A. B. Wolvin, Edwin S. Mills, D. G. Kerr, and James H. Hoyt. The company operates the following vessels.

Steamships Formerly Operated by the American Steel and Wire Company of New Jersey.

Steamships: Isaac L. Ellwood, James J. Hill, John W. Gates, Wm. Edenborn, Cresent City, Empire City, Queen City, Superior City, Zenith City, W. H. Gilbert, A. B. Wolvin, and Wm. P. Palmer.

Total, 12; annual ore-carrying capacity, based on an average of 19 trips each season, 1,252,100 gross tons.

Steamships, Whalebacks, and Barges Formerly Operated by the Bessemer Steamship Company.

Steamships: Chas R. Van Hise, Douglas Houghton, General O. M. Poe, Geo. Stephenson, James B. Eads, James Watt,

John Ericsson, Rob't W. E. Bunsen, Robert Fulton, Sam'l F. B. Morse, Sir Henry Bessemer, Sir Wm. Fairbairn, Sir Wm. Siemens, James B. Neilson, and Henry Cort.

Barges: Alexander L. Holley, Alfred Krupp, Geo. H. Corliss, James Nasmyth, John A. Roebling, John Fritz, John Smeaton, Sidney G. Thomas, Sir. I. L. Bell, W. Le B. Jenney, J. Scott Russell, and Sir. J. Whitworth.

Whaleback Steamships: Alex. McDougall, A. D. Thomson, Colgate Hoyt, E. B. Bartlett, Frank Rockefeller, James B. Colgate, John B. Trevor, J. L. Colby, Samuel Mather, and Thomas Wilson.

Whaleback Barges: 105, 107, 109, 110, 111, 116, 117, 118, 126, 127, 129, 130, 131, 132, 133, 134, 137, 201, and 202.

Total, 25 steamers and 31 barges; annual ore-carrying capacity, based on an average of 19 trips each season, 4,343,400 gross tons.

STEAMSHIPS AND BARGES FORMERLY OPERATED BY THE MINNESOTA STEAMSHIP COMPANY.

Steamships: Malieto, Manola, Maricopa, Marina, Mariposa, Mariska, Maritana, Maruba, Masaba, Matoa, Maunaloa, and Mataafa.

Barges: Madeira, Magna, Maia, Maida, Malta, Manda, Manila, Marcia, Martha, and Marsala.

Total, 12 steamers and 10 barges; annual ore-carrying capacity, based on an average of 19 trips each season, 2,052,000 gross tons.

STEAMSHIPS AND BARGES ORIGINALLY OPERATED BY THE PITTSBURGH STEAMSHIP COMPANY.

Steamships: Lafayette, Princeton, Cornell, Harvard, Rensselaer, Clarence A. Black, William R. Linn, Griffin, La Salle, Joliet, and Wawatam.

Barges: Bryn Mawr and Carrington.

Total, 11 steamers and 2 barges; annual ore-carrying capacity, based on an average of 19 trips each season, 1,276,800 gross tons.

STEAMSHIPS FORMERLY OPERATED BY THE NATIONAL STEEL COMPANY.

Steamships: Saxon, Grecian, Roman, German, Briton, Coralia, Corsica, Corona, and Cambria.

Total, 9; annual ore-carrying capacity, based on an average of 19 trips each season, 564,300 gross tons.

ESTIMATED ANNUAL ORE-CARRYING CAPACITY OF THE FOREGOING VESSELS.

The steamships, barges, and whalebacks formerly operated by the Bessemer Steamship Company have an annual ore-carrying capacity of 4,343,400 gross tons, the steamships and barges formerly operated by the Minnesota Steamship Company, 2,052,000 tons, the steamships and barges originally operated by the Pittsburgh Steamship Company, 1,276,800 tons, the steamships formerly operated by the American Steel and Wire Company of New Jersey, 1,252,100 tons, and the steamships formerly operated by the National Steel Company, 564,300 tons: making a grand total of 9,488,600 tons.

SUMMARY OF VESSELS NOW OPERATED BY THE PITTSBURGH STEAMSHIP COMPANY.

The Pittsburgh Steamship Company has acquired from the Bessemer Steamship Company 15 steamships, 10 whalebacks, and 31 barges; from the Minnesota Steamship Company 12 steamships and 10 barges; from the American Steel and Wire Company of New Jersey 12 steamers; and from the National Steel Company 9 steamers, which, with the 11 steamships and 2 barges originally operated by the Pittsburgh Steamship Company, make a grand total of 112 vessels, of which 69 are steamships and whalebacks and 43 are barges.

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LAKE SUPERIOR IRON ORE MINES.

The iron-ore mines named below are owned or controlled by the constituent companies of The United States Steel Corporation.

The iron-ore mines named below are owned or controlled by the constituent companies of The United States Steel Corporation. They are arranged according to ranges. In addition to the mines named the constituent companies of The United States Steel Corporation own several hundred thousand acres of land located in the mineral belts of Michigan and Minnesota.

Mesabi Range: Auburn, Adams, Alpena, Aetna, Alworth, d'Autremont, Burt, Biwabik, Canton, Chisholm, Cloquet, Clark, Culver, Duluth, Day, Elba, Fayal, Forster, Genoa, Great Northern, Great Western, Gross, Hull, Hartley, Humphrey, Lone Jack, Leonidas, Mahoning, Mountain Iron, Missabe Mountain, Minnewas, McKinley, Norman, Ohio, Pillsbury, Pool, Rust, Rouchleau, Sparta, Spruce, Sauntry, Sellers, Sheridan, Snively, Shaw, Stephens, Union, and Victoria.

Vermilion Range: Chandler, Minnesota, Pioneer, Savoy, Sibley, Southall, Silverman, and Zenith.

Gogebic Range: Atlantic, Aurora, North Aurora, Geneva, Norrie, North Norrie, East Norrie, Pabst, Royal, Tilden, and Vaughn.

Menominee Range: Aragon, Columbia, Chicagon Lake, Chapin, Cundy, Cuff, Dober, Forest, Gibson, Hamilton, Hilltop, Hope, Isabella, Iron River, Mansfield, Keel Ridge, Ludington, Michigan, Mueller, New Ludington, Pewabic, Walpole, and Youngstown.

Marquette Range: Bessie, Blue, Buffalo, Goodrich, Hartford, Hard Ore, Hematite, Moore, Negaunee, Prince of Wales, Section 16, Section 21, Stegmiller, Queen, and Winthrop.

COKE PLANTS IN SOUTHWEST PENNSYLVANIA.

The coke properties named below are owned or controlled by constituent companies of The United States Steel Corporation.

On August 1, 1901, all the coke properties of the Federal Steel Company, in Fayette county, Pennsylvania, were absorbed by the Southwest Connellsville Coke Company, the coke plants of the American Steel and Wire Company of New Jersey by the American Coke Company, and those of the National Steel Company by the Continental Coke Company. After August 1 the H. C. Frick Coke Company will sell the coke produced by the three coke companies named, but the properties owned by the companies will be operated by them respectively. These properties are all located in Southwestern Pennsylvania and are described as follows:

Southwest Connellsville Coke Company, in the Connellsville region, Southwest Nos. 1, 2, 3, and 4, aggregating 1,233 ovens and in the Masontown district, Buffington, Footdale, and Leckrone, aggregating 1,200 ovens; total, 2,433 ovens.

American Coke Company, in the Connellsville region, Baggaley, 400 ovens, and Dorothy, 230 ovens; in the Masontown district, Edenborn and Lambert, aggregating 1,000 ovens: total, 1,630 ovens.

Continental Coke Company in the Connellsville region, Continental Nos. 1, 2, and 3, aggregating 1,000 ovens, and Marguerite, also in the Connellsville region, 400 ovens: total, 1,400 ovens.

Office: Pittsburgh, Pa. *Officers:* The officers of each of the three coke companies mentioned are as follows: Thomas Lynch, President, C. H. Hosler, Secretary, and C. P. Parker, Treasurer, Pittsburgh; and O. W. Kennedy, General Superintendent, Scottdale, Pa. *Board of Directors:* Thomas Lynch, E. H. Gary, C. M. Schwab, O. W. Kennedy, E. J. Buffington, J. H. Price, and J. M. B. Reis.

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(From pages 79 and 80:)

THE TROY STEEL COMPANY.

The Troy Steel Company; general offices, Troy, New York; branch office, 56 Pine st., New York City. *Officers:* Frank S. Witherbee, President and Receiver; George A. Bell, Vice-President; and Lysander B. Danforth, Secretary and Treasurer. *Board of Directors:* Frank S. Witherbee, Henry H. Rogers, William Kemp, Junius S. Morgan, George A. Bell, C. W. Tillinghast, and Lysander B. Danforth. Capital stock, $2,500,000, all of which is common. The company operates or controls the following works:

Blast Furnaces—3.

Troy Furnaces, on Breaker Island, Albany county, opposite Troy, New York. Three stacks, each 80 x 18, built in 1886-7; twelve Whitwell stoves; fuel, anthracite coal and coke; ores, magnetic from Essex and Columbia counties; product, basic-Bessemer pig iron; total annual capacity, 160,000 gross tons. (Formerly operated by the Troy Steel and Iron Company.)—*Active in 1897. Idle.*

Total annual capacity of the 3 furnaces: 160,000 gross tons.

Rolling Mills and Steel Works—3.

Albany Iron Works, Troy, Rensselaer county, New York. Leased and operated by the Continuous Rail Joint Company, of Newark, N. J.; lease will not expire until May 1, 1910. (Formerly operated by the Troy Steel and Iron Company.)—*For a description of these works see Part II., Rolling Mills and Steel Works in New York.*

Bessemer Steel Works, on Breaker Island, Albany county, New York. Built at Troy, Rensselaer county, in 1864 and removed to Breaker Island (opposite Troy) and enlarged in 1896; first blow made at Troy on February 15, 1865; first blow made at Breaker Island on September 11, 1896; three 15-gross-ton basic-Bessemer converters, 4 cupolas, 4 spiegel cupolas, two 5-hole Hainsworth pit furnaces, and 24 soaking

pits; annual capacity, 200,000 gross tons of ingots. Rolling mill connected with the steel works contains one 2-high 35-inch reversing blooming mill, with 42 x 60-inch reversing engines, and one 3-high 21-inch billet mill; product, billets, blooms, slabs, and skelp; annual capacity of rolled material, 200,000 tons. Fuel, bituminous coal. (Formerly operated by the Troy Steel and Iron Company.)—*Idle.*

Rensselaer Iron Works. Troy Rensselaer county, New York. Established in 1846; merchant mill built in 1866 and 1867; new merchant mill built in 1877 and 1878; 18 heating furnaces and 4 trains of rolls; product, steel shapes and sheets and merchant steel of all kinds; annual capacity, 25,000 gross tons. Brands of steel, "XX Gun," "XX Special Dead Soft," "XX Gun Barrel," and a variety of other special grades. Fuel, bituminous coal. (Formerly operated by the Troy Steel and Iron Company.)—*Idle.*

Total annual capacity of the 3 rolling mills and steel works, including the Albany Iron Works: Bessemer steel ingots, 200,000 gross tons, rolled products, 275,000 tons.

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(From pages 117 and 118):

THE SHARON STEEL COMPANY.

The Sharon Steel Company; general offices, Sharon, Pa. *Officers*: George W. Darr, President; John Stevenson, Jr., Vice-President and General Manager; V. M. Delamater, Secretary; David Adams, Treasurer; N. McConnell, General Superintendent; and J. P. Whitla, Sales Agent. *Board of Directors*: George W. Darr, John Stevenson, Jr., F. H. Buhl, William Flinn, George H. Flinn, N. McConnell, J. P. Whitla, David Adams, and John Fahnline. Capital stock, $5,000,000. The company operates the following works:

Blast Furnaces—1 Completed and 1 Projected.

Sharon (The) Steel Company, Sharon, Mercer county, Pa. One stack, 100 x 22, built in 1900-1901 and blown in in September, 1901; four Kennedy-Cowper stoves, 22 x 100; fuel,

coke; ore, Lake Superior; product, basic pig iron; annual capacity, 200,000 gross tons. An additional furnace is projected.

Annual capacity: 200,000 gross tons.

ROLLING MILLS AND STEEL WORKS—1.

Sharon (The) Steel Company, Sharon, Mercer county, Pa. Built in 1900-1901 and first put in operation in May, 1901; 4 continuous heating furnaces, 4 soaking pits, 5 trains of rolls (one blooming, 2 bar, and 2 rod), 200 wire-drawing blocks, and 200 wire-nail machines. Eight 50-gross-ton basic open-hearth steel furnaces with an annual capacity of 300,000 gross tons of ingots; first steel made April 30, 1901; five additional 50-gross-ton furnaces are being built. Product, open-hearth steel billets, tinplate bars, sheet bars, slabs, blooms, skelp, wire rods, wire, and wire nails; annual capacity, 300,000 gross tons of rolled products, 75,000 tons of wire, and 1,000,000 kegs of wire nails. Fuel, producer gas and coal.

Total annual capacity of the rolling mills and steel works: Open-hearth steel ingots, 300,000 gross tons; rolled products, 300,000 tons; wire, 75,000 tons; and wire nails, 1,000,000 kegs.

WIRE-ROD MILL.

The wire-rod mill contains two trains of rolls, and has an annual capacity of 125,000 gross tons of rods.

WIRE-DRAWING PLANT.

The wire-drawing plant contains 200 wire-drawing blocks; sizes of wire drawn, from ½ of an inch to No. 22 gauge; product, plain wire, barbed wire, galvanized staples, etc.; annual capacity, 75,000 gross tons of wire.

WIRE-NAIL PLANT.

The wire-nail plant is equipped with 200 wire-nail machines, produces all sizes of nails, and has an annual capacity of 1,000,000 kegs. Additional machines will be added.

WROUGHT-PIPE PLANT.

A plant for the manufacture of wrought pipe is now being erected. Steel pipe only will be made at first, although iron pipe may be made later on. The annual capacity of this department will be 120,000 gross tons. The plant will probably be completed and in operation in February, 1902.

GALVANIZING AND SOCKET DEPARTMENTS.

Galvanizing and socket departments will be connected with the wrought-pipe plant.

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(From page 223):

PROJECTED—2 STACKS.

Union Steel Company, Empire Building, Pittsburgh. Contemplates erecting 2 blast furnaces at Donora, Washington county, with a daily capacity of 600 gross tons each; furnaces will each be 85 x 22 feet and will be completed about January 1, 1903.

(From pages 227 and 228):

Union Steel Company, Empire Building, Pittsburgh. Works at Donora, Washington county. Built in 1900-1 and first put in operation in September, 1901; 4 heating furnaces, 1 continuous and 1 right and 1 left hand Garrett finishing rod mill, 300 wire-drawing blocks, and 200 wire-nail machines; product, wire rods, bright and galvanized wire, barbed wire, wire fencing, and wire nails; annual capacity, 200,000 gross tons of wire rods, 200,000 tons of wire, and 1,000,000 kegs of wire nails. Fuel, natural gas and coal. Twelve 50-gross-ton basic open-hearth steel furnaces will be added. W. H. Donner, President; A. W. Mellon, Vice-President; S. H. Waddell, Secretary; R. B. Mellon, Treasurer.

(From pages 398 and 399):

Union Steel Company, Pittsburgh. After April 1 the

office address will be Frick Building instead of Empire Building. Ground will be broken in February or March for two new blast furnaces, each to be 90 x 22, not 85 x 22. Twelve 50-gross-ton basic open-hearth steel furnaces are now being added to the rolling mill department. S. H. Waddell will not be Secretary after February 1. Nevin McConnell is Superintendent of the steel department.

Government Exhibit No. 328.

December 17, 1912.

(Comprising the following extracts from volume entitled "Directory to the Iron and Steel Works of the United States, 1890.")

(From page 26:)

Edgar Thomson Furnaces, Carnegie Brothers & Co., Limited, Bessmer Station, Allegheny county. Branch office and post-office address, 48 Fifth avenue, Pittsburgh. Seven completed stacks and two stacks building. Furnace A, 65 x 15, built in 1879, has four Siemens-Cowper-Cochrane stoves, each 65 x 15. Furnaces B and C, each 80 x 20, built in 1880, have eight Siemens-Cowper-Cochrane stoves, six 75 x 20 and two 75 x 21. Furnaces D and E, each 80 x 22, built in 1881, have six Simens-Cowper-Cochrane stoves, each 78 x 21, and one Whitwell stove, 78 x 20. Furnaces F and G, each 80 x 22, built in 1886 and 1887, have seven Siemens-Cowper-Cochrane stoves, each 78 x 21. Furnaces H and I each to be 90 x 22 building. Fuel, Connellsville coke; ores, Pennsylvania, Lake Superior, Missouri, and foreign; product, Bessemer pig iron, spiegeleisen, and ferro-manganese. Combined annual capacity of completed furnaces, 450,000 net tons; annual capacity of furnaces building, 195,000 net tons. James Gayley, Superintendent of furnaces.

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(From pages 26 and 27:)

Lucy Furnaces, Carnegie, Phipps & Co., Limited, Fifty-first st. (branch office, 48 Fifth avenue), Pittsburgh. Two stacks, each 75 x 20; No. 1 first put in blast in May, 1872, and

No. 2 first put in blast September 27, 1877; seven Whitwell stoves; ores, mainly Lake Superior; product, Bessemer, forge, and foundry pig iron; total annual capacity, about 150,000 net tons. Brand, "Lucy." James Scott, Superintendent.

(From pages 58 and 59:)

Illinois Steel Company, Rookery Building, Chicago, Cook county. Twelve completed stacks and one stack building in Illinois. North Works, located at Chicago, on North branch of Chicago river, at the foot of Wanbansia avenue have two stacks (Nos. 1 and 2), each 66 x 17, built in 1869; three Player iron stoves and three fire-brick stoves; annual capacity, 80,000 net tons. South Works, located at South Chicago, have four stacks (Nos. 5, 6, 7 and 8), each 75 x 21, built in 1880-1, two of which were put in blast in 1881 and two were put in blast in 1882; twelve fire-brick stoves; annual capacity, 287,000 net tons. Joliet Works, located at Joliet, Will county, have two completed stacks and one stack building; No. 1 and No. 2, each 80 x 20, built in 1873; No. 1 first put in blast in June, 1880, and No. 2 first put in blast in January, 1882; three Gordon-Whitwell-Cowper and three Siemens-Cowper-Cochrane stoves; annual capacity, 160,000 net tons; No. 3, building, to be 80 x 20, and to be completed in March, 1890; four Massick and Crook stoves. Union Works, located at Chicago, have four stacks, two, each 72 x 13, built in 1869, and rebuilt in 1885, and two, each 74 x 16, built in 1881 and 1882; two Cowper and eight Whitwell stoves; annual capacity, 200,000 net tons. Fuel used by all these furnaces, Connellsville coke; ore, Lake Superior; specialty, Bessemer pig iron. *See Furnaces in Wisconsin. See Rolling Mills in Illinois and Wisconsin.*

(From pages 63 and 64:)

Illinois Steel Company, Rookery Building, Chicago, Ill. Three stacks in Wisconsin: Milwaukee Works, located at Bay View, Milwaukee, Milwaukee county, have two stacks (Nos. 3 and 4), each 66 x 17, built in 1870 and 1871; ores $\frac{11}{12}$ Lake Superior and $\frac{1}{12}$ Iron Ridge; annual capacity, 65,000 net tons. Mayville Furnace, located at Mayville, Dodge county, has one stack 67 x 13, built in 1848 as a charcoal furnace, rebuilt in 1872 and 1884, and remodeled and enlarged in 1887

to use coke; ores, Menominee, Gogebic, and local; annual capacity, 20,000 net tons. Fuel used at both works, Connellsville coke; product, Bessemer, foundry, and mill pig iron. *See Furnaces in Illinois. See Rolling Mills in Illinois and Wisconsin.*

(From page 116:)

Allegheny Bessemer Steel Company, Duquesne, Allegheny county. Built in 1886-8, and first put in operation in 1889; two 6-gross ton Bessemer converters; first blow made in February, 1889, and first rail rolled in March, 1889; 3 soaking pits and 4 trains of rolls (two 21-inch continuous and reversing, one 26-inch, and one 30-inch); rails rolled from ingot at initial heat; annual capacity, 220,000 net tons of rails. Fuel used, natural gas exclusively. Edward L. Clark, President; H. P. Smith, Secretary; F. H. Treat, Manager, Selling Agent, F. G. Gorham, Mills Building, New York.

(From pages 118 and 119.)

Carnegie, Phipps & Co. Limited, 48 Fifth Ave., Pittsburgh. Three mills in Allegheny county. Homestead Steel Works, at Munhall Station, formerly operated by the Pittsburgh Bessemer Steel Company Limited. Built in 1880-1 two 5-gross-ton converters; first blow made March 19, 1881; first steel rail rolled August 9, 1881; one 28-inch blooming mill, one 23-inch and one 33-inch train for structural shapes, one 10-inch mill, one 32 inch slabbing mill for rolling heavy ingots, and one 120-inch plate mill for rolling high grade boiler steel and ship and tank plate. Open-hearth steel plant completed and put in operation in October, 1886; one 15-gross-ton, four 20-gross-ton, and two 35-gross-ton Siemens-Martin furnaces. Ground has been broken for eight additional 15-gross-ton open-hearth furnaces. Product, blooms, billets, structural shapes, bridge steel, best boiler plates, armor plate, and ship and tank plate; annual capacity, 180,000 net tons of Bessemer steel ingots, 40,000 tons of steel plates, and 75,000 tons of miscellaneous steel products. Fuel used, natural gas exclusively. J. A. Potter, Superintendent. Upper Union Mills, at Thirty-third st. Built in 1862; 42 single puddling furnaces, 13 single and 5 double Siemens heating furnaces, and 8 trains of rolls (one 8, one 12, four 18, and two 20-inch); product, structural iron and steel, iron and steel bars, iron and steel universal mill

plates, light steel rails and special shapes; annual capacity of iron and steel 80,000 net tons. Fuel used, natural gas exclusively. H. W. Borntraeger, Superintendent. Lower Union Mills, twenty-ninth st., formerly operated by Wilson, Walker & Co. Limited. First put in operation in 1862; 42 single puddling furnaces, 18 heating furnaces, 6 trains of rolls, (two universal, one 10, one 15, one 18, and one 20-inch,) 25 forge fires, and 16 hammers (700 to 7,000 pounds); product, universal mill plates, railway forgings, bridge work, structural shapes, axles, links and pins, and bar iron; annual capacity of iron and steel, 50,000 net tons. H. W. Borntraeger, Superintendent. Fuel used, natural gas exclusively. Wm. L. Abbott, Chairman; H. M. Curry, Vice-Chairman; L. C. Phipps, Treasurer; Otis H. Childs, Secretary; Wm. P. Palmer, General Sales Agent.

(From page 120.)

Edgar Thomson Steel Works, Carnegie Brothers & Co. Limited, Bessemer Station, Allegheny County. Branch office and post office address, 48 Fifth Avenue, Pittsburgh. Began operations in August, 1875; four 10-gross-ton converters, 6 pig-iron cupolas and 4 spiegel cupolas, 22 Siemens heating furnaces, one 3-high 38-inch blooming mill, one shear and one 3-ton, hammer for shearing and clipping blooms, two 3-high rail trains, (one 23 and one 24-inch,) and hot-saw and finishing machinery; forge, containing one 6-ton hammer and two heating furnaces, and machine and smith shops attached; product, only Bessemer steel in the several forms of rails, blooms, and billets; daily capacity, double turn, 1,300 gross tons of ingots, 1,050 gross tons of rails, and 300 gross tons of billets. First blow made August 25, 1875, and first rail rolled September 1, 1875. Brand, "Edgar Thomson Steel." Use the best quality of Bessemer pig iron, containing not over 0.1 per cent. of phosphorus; natural gas exclusively used under boilers and in heating furnaces. H. C. Frick, Chairman; J. G. A. Leishman, Vice-Chairman and Treasurer; F. T. F. Lovejoy, Secretary; Charles M. Schwab, General Superintendent.

(From pages 160 and 161:)

Illinois Steel Company, Rookery Building, Chicago, and

151 Insurance Block, Milwaukee, Wis. Four plants in Illinois, styled the North Works, South Works, Joliet Works, and Union Works. North Works, W. L. Potter, Superintendent, located at Chicago, on the north branch of the Chicago river, at the foot of Waubansia avenue, built in 1857; one sextuple and 8 quadruple puddling furnaces, equal to 38 single furnaces, 23 heating furnaces, 10 trains of rolls, and one hammer; Bessemer steel works have two 6-gross-ton converters and all appliances for manufacturing rails; made first blow April 10, 1872; first steel rail rolled May 24, 1865, from steel made at Wyandotte, Michigan; product, Bessemer steel ingots, iron and Bessemer steel rails, and steel beams; annual capacity, 156,000 net tons ingots, 125,000 tons steel rails, 60,000 tons iron rails, and 50,000 tons steel beams, which last would come out of rail capacity. South Works, D. S. Mathias, Superintendent, located at South Chicago, made first blow June 14, 1882; contain three 10-gross-ton Bessemer converters, 5 Siemens heating furnaces, one 3-high 40-inch blooming train, and one 2-high reversing finishing train of rolls; product, Bessemer steel ingots and rails; annual capacity, 330,000 net tons ingots and 300,000 tons rails. These works are to be extended by the addition of four more blast furnaces, each 85 x 21, an open hearth steel plant of four 15-gross-ton furnaces, and a plate mill. Work on the blast furnaces has been started. Joliet Works, H. S. Smith, Manager, located at Joliet, Will county, built in 1870; contain two 8-gross-ton Bessemer converters; made first blow January 26, 1873, and first steel rail March 15, 1873; annual capacity, 235,000 net tons of Bessemer steel ingots. Steel rail mill has 6 heating furnaces, one 36-inch blooming train, one 23-inch rail train, and a Sellers 3-ton hammer; annual capacity, 210,000 net tons of rails. The wire-rod mill, built in 1888, contains one Garrett mill with an annual capacity of 40,000 net tons. Union Works, W. R. Walker, Superintendent, located at 3179 Ashland avenue, Chicago; original mill built in 1863, and original Bessemer steel works made first blow July 26, 1871; Bessemer steel works and rail mill rebuilt in 1885-6; two 10-gross-ton converters, 5 cupolas, 4 spiegel cupolas, 3-high 35-inch blooming mill, 3 gas ingot-heating furnaces, one gas bloom-heating furnace, and one 3-high 25-inch rail train;

product, Bessemer steel rails; annual capacity, 350,000 net tons ingots and 300,000 tons rails. Use oil for fuel at South Works and at Union Works. (Also 7 heating furnaces, one 22-inch plate, one 20-inch billet, one 18-inch bar, and one wire-rod mill, not now in use.) O. W. Potter, Chairman, Chicago; A. J. Forbes-Leith, President, 46 Wall st., New York; other officers at Chicago are as follows: W. R. Stirling, 1st Vice-President; E. C. Potter, 2d Vice-President; Jay C. Morse, member of Executive Committee; J. C. Stirling, Assistant to 1st Vice-President; J. J. Wait, Assistant to 2d Vice-President; Richard C. Hannah, Secretary and Treasurer; Robert Forsyth, Engineer; H. A. Gray, Comptroller; J. L. Yale, General Sales Agent; J. H. Long, Manager freight department. *See Furnaces in Illinois. See Furnaces and Rolling Mill in Wisconsin.*

(From page 164:)

Illinois Steel Company, Rookery Building, Chicago, Ill., and 151 Insurance Block, Milwaukee, Wis. Milwaukee Works, Francis Hinton, Manager, and E. L. Bennet, Cashier, located at Bay View, Milwaukee, built in 1868 and 1874, and nail mill added in 1884; 8 quadruple puddling furnaces, 19 coal and 5 Siemens heating furnaces, 7 trains of rolls, (one 8, one 9, one 12, two 18, one 21, and one 22-inch,) 100 nail machines, and one hammer; product, rails, nails, merchant bar iron, fish-plates, car links and pins, and horse shoes; annual capacity, 50,000 net tons of bar iron and rails, 25,000 tons of fish-plates, etc., and 300,000 kegs of nails. *See Furnaces in Wisconsin. See Furnaces and Rolling Mills in Illinois.*

Government Exhibit (Gray) No. 329
December 17, 1912

Note.--The production of the Tennessee Coal, Iron, and Railroad Company is included with the production of the Independent companies for the year 1906

COMPARATIVE PRODUCTION OF ALL KINDS OF FINISHED ROLLED IRON AND STEEL BY THE SUBSIDIARY COMPANIES OF THE UNITED STATES STEEL CORPORATION AND BY THE INDEPENDENT COMPANIES IN 1906

Products	1906--GROSS TONS				
	Production			Percentage	
	Corporation	Independents	Total	Corporation	Independents
Bessemer Steel Rails.	1,995,868	1,795,591	3,791,459	52.64	47.36
Open-Hearth S. Rails.	1,703	184,710	186,413	0.91	99.09
Iron Rails.....	0	15	15	0.00	100.00
Structural Shapes....	1,157,271	961,501	2,118,772	54.62	45.38
Plates.--No. 12 gauge and thicker.....	1,314,600	1,216,952	2,531,552	51.93	48.07
Sheets--No. 13 gauge and thinner.....	1,040,190	610,414	1,650,604	63.02	36.98
Black Plates for tin-					

Government Exhibit (Gray) No. 330
December 17, 1912

PRODUCTION OF PIG IRON BY GRADES.

The following table gives the total production of pig iron by grades from 1901 to 1905 in gross tons of 2,240 pounds.

Grades--Gross tons.	1901	1902	1903	1904	1905
Bess. and low-phos.	9,586,793	10,393,168	9,989,908	9,098,659	12,407,116
Basic (mineral fuel)	1,448,850	2,038,590	2,040,726	2,483,104	4,105,179
Forge pig iron	639, 54	833,093	783,016	550,836	727,817
Fdy. and ferro-sil	3,548,718	3,851,276	4,409,023	3,627,289	4,758,038
Malleable Bessemer	286,532	311,458	473,781	263,529	635,336
Spiegeleisen	231,822	168,408	156,700	162,370	227,797
Ferro-manganese	59,639	44,526	35,961	57,076	62,186
White, mottled, direct castings, etc.	96,546	160,788	120,137	54,230	69,011
Total	15,878,354	17,521,307	18,009,252	16,497,033	22,992,380

In the following table the production of pig iron by grades is given from 1906 to 1910 in gross tons of 2,240 pounds.

Grades--Gross tons.	1906	1907	1908	1909	1910
Bess. and low-phos.	13,840,518	13,331,620	7,216,976	10,557,370	11,245,642
Basic (mineral fuel)	5,016,674	5,375,219	4,010,144	8,250,225	9,084,608
Forge pig iron	597,420	683,167	457,164	725,624	564,157
Fdy. and ferro-sil	4,773,011	5,181,209	3,637,622	5,322,415	5,260,447
Malleable Bessemer	699,701	920,290	414,967	658,048	843,123
Spiegeleisen	244,980	283,430	111,376	142,831	153,055
Ferro-manganese	55,520	55,918	40,642	82,209	71,376
White, mottled, direct castings, etc.	77,367	80,508	47,137	56,749	81,159
Total	25,307,191	25,781,361	15,936,018	25,795,471	27,303,567

The Bessemer figures include low-phosphorus pig iron, that is, iron running below 0.04 per cent. in phosphorus. Pig iron containing from 0.04 to 0.10 per cent. of phosphorus is classified as Bessemer. The basic figures do not include the small quantity of basic iron that is made with charcoal. A few thousand tons of castings direct from the furnace are included in the totals for white and mottled and miscellaneous grades of pig iron; also small quantities of ferro-phosphorus, ferro-titanium, and other alloys. Ferro-silicon, Bessemer ferro-silicon, and high-silicon pig iron are included in the foundry figures given in the table.

Government Exhibit (Gray) No. 331
December 17, 1912

The following table gives the production of iron and steel plates and sheets since 1905

Years. Gross tons.	Plates--No. 12 and thicker			Sheets--No. 13 and thinner		
	Iron	Steel	Total	Iron	Steel	Total
1905.....	10,022	2,031,184	2,041,206	62,134	1,428,890	1,491,024
1906.....	23,333	2,508,219	2,531,552	51,040	1,599,564	1,650,604
1907.....	30,277	2,629,783	2,660,060	43,761	1,545,011	1,588,772
1908.....	31,679	1,239,342	1,271,021	22,354	1,356,318	1,376,672
1909.....	32,332	2,346,766	2,379,098	43,870	1,811,378	1,855,248
1910.....	37,763	2,769,965	2,807,728	53,355	2,094,401	2,147,756

Government Exhibit (Gray) No. 332
December 17, 1912

The following table gives the production of black plates, or sheets, for tinning by States in the last six years in gross tons.

States--Gross tons.	1905	1906	1907	1908	1909	1910
Pennsylvania.....	256,329	312,977	253,807	278,163	308,982	427,530
Md. and West Va.....	69,180	94,076	95,933	92,860	115,866	132,483
Ohio, Ind., Ill., & Mo.....	182,078	169,026	154,328	142,748	181,634	152,124
Total.....	507,587	576,079	504,072	513,771	606,483	712,137

9169

Government Exhibit (Gray) No. 333
December 17, 1912

The following table gives by States the production of nail and spike plate in the last five years in gross tons. In 1910 twelve plants in six States rolled iron or steel nail or spike plate.

States--Gross tons.	1906	1907	1908	1909	1910
Pennsylvania	32,039	32,004	26,148	32,341	24,479
Mass., West Va., and Ky	13,779	13,179	14,406	25,405	14,945
Ohio, Ill., and California	8,393	6,844	5,193	6,000	5,870
Total	54,211	52,027	45,747	63,746	45,294

PRODUCTION OF MISCELLANEOUS ROLLED PRODUCTS

The production of merchant bars, skelp, spike rods, bolt rods, splice bars, hoops, bands, cotton-ties, strips, rolled axles, rolled armor plate, and other forms of finished rolled iron and steel for which statistics have not been given in the Annual Report for 1909 is given in the following table. Rolled forging blooms and forging billets are included from 1905, but forged armor plate, hammered axles, and other forgings are not included for any year.

In 1909 there were 142 plants in 25 States which rolled iron or steel merchant bars, 16 plants in 9 States which rolled steel bars for reinforced concrete work, 44 plants in 4 States which rolled skelp, flue, or pipe iron or steel, 19 plants in 9 States which rolled iron or steel splice bars, 15 plants in 6 States which rolled iron or steel hoops, 15 plants in 7 States which rolled iron or steel bands or cotton-ties, 24 plants in 9 States which rolled forging blooms or forging billets, and 72 plants in 15 States which rolled spike and chain rods, bolt and nut rods, horseshoe bars, strips, shovel blanks, axles and other miscellaneous forms.

In 1909 the production of the rolled articles above named was 7,711,506 tons as compared with 4,311,608 tons in 1908, an increase of 3,399,898 tons, or over 78.8 per cent. Of the production in 1909 about 6,139,015 tons were steel and about 1,572,491 tons were iron, as compared with about 3,145,677 tons of steel and about 1,165,931 tons of iron in 1908, showing an increase in steel of 2,993,338 tons and in iron of 406,560 tons.

Articles--Gross tons.	Iron.	Steel.	Total
Merchant bars	952,230	2,311,301	3,263,531
Bars for reinforced concrete work	.....	159,352	159,352
Skelp, flue, etc	370,151	1,663,230	2,033,381
Splice bars	12,912	187,371	200,283
Hoops	4,018	246,161	250,179
Bands and cotton-ties	4,118	391,215	395,333
Rolled forging blooms and forging billets	376	341,397	341,773
Spike and chain rods, bolt and nut rods, etc	228,686	838,988	1,067,674
Total for 1909	1,572,491	6,139,015	7,711,506
Total for 1908	1,165,931	3,145,677	4,311,608
Total for 1907	2,104,505	5,867,869	7,972,374
Total for 1906	2,089,070	5,294,758	7,383,828
Total for 1905	1,950,546	4,447,561	6,398,107
Total for 1904	1,662,896	2,934,601	4,597,497

Government Exhibit No. 335.

For Government Exhibit No. 335 see Government Exhibit No. 356 which covers the subject matter thereof.

Government Exhibit No. 336.

For Government Exhibit No. 336 see Government Exhibit No. 357 which covers the subject matter thereof.

Government Exhibit No. 337.

For Government Exhibit No. 337 see Government Exhibit No. 358 which covers the subject matter thereof.

Government Exhibit No. 338.

(for identification)

This exhibit was not offered in evidence, and will not be printed in connection with the exhibits.

Government Exhibit No. 339.

(January 22, 1913.)

THE WHITE HOUSE.
WASHINGTON

NOVEMBER 4, 1907.

MY DEAR MR. ATTORNEY GENERAL:

Judge E. H. Gary and Mr. H. C. Frick on behalf of the Steel Corporation have just called upon me. They state that

there is a certain business firm (the name of which I have not been told, but which is of real importance in New York busines circles) which will undoubtedly fail this week if help is not given. Among its assets are a majority of the securities of the Tennessee Coal Company. Application has been urgently made to the Steel Corporation to purchase this stock as the only means of avoiding a failure. Judge Gary and Mr. Frick inform me that as a mere business transaction they do not care to purchase the stock; that under ordinary circumstances they would not consider purchasing the stock because but little benefit will come to the Steel Corporation from the purchase; that they are aware that the purchase will be used as a handle for attack upon them on the ground that they are striving to secure a monopoly of the business and prevent competition—not that this would represent what could honestly be said, but what might recklessly and untruthfully be said. They further inform me that as a matter of fact the policy of the Company has been to decline to acquire more than sixty per cent. of the steel properties, and that this purpose has been persevered in for several years past, with the object of preventing these accusations, and as a matter of fact their proportion of steel properties has slightly decreased, so that it is below this sixty per cent., and the acquisition of the property in question will not raise it above sixty per cent. But they feel that it is immensely to their interest, as to the interest of every responsible business man, to try to prevent a panic and general industrial smash-up at this time, and that they are willing to go into this transaction, which they would not otherwise go into, because it seems the opinion of those best fitted to express judgment in New York that it will be an important factor in preventing a break that might be ruinous; and that this has been urged upon them by the combination of the most responsible bankers in New York who are now thus engaged in endeavoring to save the situation. But they asserted they did not wish to do this if I stated that it ought not to be done. I answered that while of course I could not advise them to take the action

proposed, I felt it no public duty of mine to interpose any objection.

Sincerely yours,
(Signed) THEODORE ROOSEVELT.

Hon. CHARLES J. BONAPARTE,
Attorney General.

Government Exhibit No. 340.

(January 23, 1913.)

(Consisting of pages 196 to 200 of volume entitled "The Iron and Steel Works of the United States. 1908.")

TENNESSEE COAL, IRON, AND RAILROAD COMPANY.

Tennessee Coal, Iron, and Railroad Company; general offices, Birmingham, Ala.; New York offices, Realty Building, 115 Broadway. *Officers at Birmingham*: ————————, President; F. H. Crockard, Vice-President and General Manager; W. A. Green, Secretary and Treasurer; T. M. Nesbitt, Auditor; Frank A. Burr, General Manager of Sales; and W. A. Major, Purchasing Agent. *Officer at New York*: John A. Topping, Chairman Board of Directors.

Selling Agencies: Realty Building, 115 Broadway, New York; First National Bank Building, Chicago; First National Bank Building, Cincinnati; Missouri Trust Building, St. Louis; Frick Building Annex, Pittsburgh; Citizens Building, Cleveland; and Endicott Building, St. Paul.

Kinds of Pig Iron: Foundry, forge, mill, basic, ferromanganese and spiegeleisen. *Brands*: For steel and steel rails, "Ensley basic open hearth;" for pig iron, "Ensley," "Bessemer," "DeBardeleben," "Oxmoor," "Eureka," "Alice," and "South Pittsburg."

Brands for Coal and Coke: For coal: "Pratt," "Blocton," "Cahaba," "Blue Creek," "Gamble," "Henry-

Ellen," and "Whitwell." For coke: "Pratt," "Blue Creek," "Bessemer," "Whitwell," and "By-product."

Capital stock authorized, $50,000,000, of which $25,866,435 of common and $248,300 of preferred had been issued to March 1, 1907. Transfer Agents: Hanover National Bank, of New York. The Tennessee Coal, Iron, and Railroad Company operates the blast furnaces, rolling mills, steel works, etc., described below:

BLAST FURNACES—16.

Alice Furnace, Birmingham, Alabama. One stack, No. 2, 75 x 18, built in 1883 and put in blast July 24, 1883; rebuilt in 1902; six Whitwell stoves; fuel, Pratt coke made in the company's ovens; ores, red and brown from the company's mines; product, foundry, forge, and basic pig iron; annual capacity, 72,000 tons. Brand, "Alice." (Furnace No. 1, 75 x 15, built in 1879-80, dismantled in 1905.)—*Active in 1907.*

Bessemer Furnaces, Bessemer, Alabama. Five stacks: Nos. 1 and 2, each 75 x 16, built in 1886-7; No. 1 put in blast in 1888 and No. 2 in 1889; eight Whitwell stoves. Nos. 3 and 4, each 75 x 17, built in 1889-90 and No. 3 rebuilt in 1900; eight Whitwell stoves. No. 5, or Little Belle, 60 x 12, built in 1889-90; three Whitwell stoves. Fuel, Pratt and Blue Creek coke made in the company's ovens; ores, red and brown from the company's mines; product, foundry and forge pig iron; total annual capacity, 288,000 tons. Brand, "DeBardeleben." —*Nos. 1, 2, 3, and 4 active in 1907; No. 5 not active to September 1, 1907, but to resume in that month.*

Ensley Furnaces, Ensley, Alabama. Six stacks: four, 80 x 20, built in 1887, 1888, and 1889; one, 85 x 20, built in 1903-5; and one, 86 7-12 x 20 3-4, built in 1905-6. No. 1 blown in March 19, 1889, and rebuilt in 1901; No. 2 blown in December 1, 1888, No. 3 blown in June 5, 1888, No. 4 blown in April 9, 1888, and rebuilt in 1907, No. 5 blown in August 17, 1906, and No. 6 blown in April 28, 1905. Nos. 1 and 2 have each four Gordon-Whitwell-Cowper stoves, Nos. 3, 4, and 5 have each four Massicks & Crooke stoves, and No. 6 has four Kennedy 2-pass stoves. Fuel, Pratt coke from the company's ovens and Semet-Solvay coke from ovens at Ensley; ores, red

and brown from the company's mines; product, foundry, forge, and basic pig iron; total annual capacity, 576,000 tons. Brand, "Ensley." Two Uehling pig-iron casting machines. Nos. 3, 2, and 1 will be rebuilt in the order named; each stack will be 85 x 21½, will be equipped with four Massicks & Crooke stoves, and will have an annual capacity of 120,000 tons. (One stack, No. 5, built in 1899-1900, dismantled in 1905.)—*All active in 1907.*

Oxmoor Furnaces, Oxmoor, Alabama. Two alternate stacks: No. 1, 75 x 17, completed in July, 1877, and rebuilt and blown in December, 1885; again rebuilt in 1902; No. 2, 75 x 17, first blown in in March, 1876; rebuilt and blown in in August, 1886; again rebuilt in 1899; seven Whitwell stoves; fuel, Pratt and Blue Creek coke made in the company's ovens; ores, red and brown from the company's mines; product, foundry and forge pig iron; total annual capacity, 120,000 tons. Brand, "Eureka."—*One active in 1907.*

South Pittsburg Furnaces, South Pittsburg, Tennessee. Two stacks: No. 2, 70 x 18, completed in 1881 and first blown in in March, 1882, and No. 3, 75 x 17, built in 1887-8 and first blown in in March, 1888; ten Whitwell stoves; fuel, coke made in the ovens of the company at Tracy City, Whitwell, and Victoria; ores, brown hematite from Georgia and hard red fossiliferous from the mines of the company; product, foundry and forge pig iron; total annual capacity, 110,000 tons. Brand, "South Pittsburg." (No. 1, 70 x 18, first blown in in May, 1879, partly dismantled in 1903.)—*Idle; No. 2 last active in July, 1904, and No. 3 in November, 1905.*

Total annual capacity of the 16 furnaces: 1,166,000 gross tons.

ROLLING MILLS AND STEEL WORKS—1 OWNED AND THREE LEASED.

Bessemer Rolling Mills, Bessemer, Alabama. Built in 1887-8 and put in operation in September, 1888; 24 single puddling furnaces, 6 heating furnaces, one annealing furnace, 5 trains of rolls, (one 20-inch muck, one 8-inch guide, one 16-inch bar, one 22-inch sheet, and one 26-inch plate,) 9 Siemens gas producers, 2 plate straighteners, 3 rail straighteners, and

one angle straightener; product, bar, guide, light and heavy plates up to 65 inches wide, and light rails; annual capacity, 60,000 tons. Fuel, coal and producer gas.

Birmingham Steel Works, Birmingham, Alabama. Two basic open-hearth steel furnaces (one 20 and one 25-gross-ton) built in 1897, 6 open-type gas producers, and two 40-ton cranes; first steel made July 22, 1897; product, rail ingots; annual capacity, 20,000 tons. Fuel, producer gas. (Owned by the Republic Iron and Steel Company; formerly operated by the Birmingham Rolling Mill Company; leased by the Tennessee Coal, Iron, and Railroad Company on May 1, 1906.)—*See pages 94 95.*

Steel Casting Department, Ensley, Alabama. Built in 1900; one 15-gross-ton basic open-hearth steel furnace; first steel made August 31, 1900; product, car couplers, gears, rolls, engine parts, and other steel castings; annual capacity from 8,000 tons to 12,000 tons. Fuel, producer gas. An iron foundry is connected with the works. (Owned by the Alabama Steel and Shipbuilding Company and operated under lease by the Tennessee Coal, Iron, and Railroad Company.)

Steel Works Division, Ensley, Alabama. Built in 1898-9; first heat poured November 30, 1899; eleven 50-gross-ton basic open-hearth furnaces (10 tilting and one stationary) with an annual capacity of 350,000 tons of ingots; one coal reheating furnace, five 4-hole soaking pits, and one 44-inch blooming mill; product, blooms, billets, and slabs; also one 27-inch rail train with one 2-high 34-inch roughing mill; rail mill now being rebuilt and will probably be ready for operation in November, 1907; first steel rail rolled November 14, 1902; estimated annual capacity of rebuilt mill, 60,000 tons of rails. Fuel, producer gas. Connected with the works are one 250-gross-ton rolling acid-lined primary furnace and one 15-gross-ton acid-Bessemer converter for desiliconizing and decarburizing molten metal for the open-hearth steel furnaces, the metal being obtained from the Ensley Furnaces; primary furnace first put in operation February 14, 1904, and Bessemer converter February 17, 1904; lining of primary furnace may be changed from acid to basic. This department of the works is known as Ensley Plant No. 1. The company is now adding to these works four 60-gross-ton tilting basic open-hearth steel

furnaces with an annual capacity of 300,000 tons of ingots and two 20-gross-ton removable acid-Bessemer converters; the Bessemer converters are to be used in desiliconizing and decarburizing molten metal for the open-hearth steel furnaces; the 4 building open-hearth furnaces will be ready for operation in November, 1907, and the 2 building Bessemer converters in September or October, 1907. Two additional 65-gross-ton basic open-hearth steel furnaces are to be built. This department is known as Ensley Plant No. 2. (Owned by the Alabama Steel and Shipbuilding Company and operated under lease by the Tennessee Coal, Iron, and Railroad Company.)

Total annual capacity of the 4 works, including additions now being made: 670,000 gross tons of open-hearth steel ingots, from 8,000 tons to 12,000 tons of steel castings, 600,000 tons of steel rails, and 60,000 tons of other finished rolled iron and steel products.

Iron Foundry.

At Ensley the company operates a gray iron foundry, which makes castings principally for its own use; annual capacity, 4,200 tons.

Coal Mines, Coke Ovens, Iron-Ore Mines, Etc.

In addition to the above works the Tennessee Coal, Iron, and Railroad Company owns and operates the following properties:

Thirty-one coal mines with a total annual capacity of 5,700,000 tons of coal, located at or near Pratt City, Ensley, Wylam, Stockton, Blossburg, Adger, Johns, Sumter, Blocton, Henry-Ellen, and Gamble in Alabama and Whitwell and Tracy City in Tennessee.

Sixteen coking plants, with 3,732 bee-hive coke ovens, having a total annual capacity of 1,800,000 tons of coke, located at Pratt City, Ensley, Wylam, Bessemer, Johns, Blocton, and Birmingham in Alabama and at Whitwell and Victoria in Tennessee.

Twenty-nine iron-ore mines, with a total annual capacity of 3,000,000 tons of red and brown hematite ores, located at

or near Green Springs, Ishkooda, Smythe, Redding, Readers, Leogusta, Spring Gap, Martaban, Standiford, Giles, Bessemer, and Potter in Alabama and near Emerson in Georgia.

Extensive limestone and dolomite quarries at Ketona, Vanns, and Calcis in Alabama and at South Pittsburg in Tennessee, with a total annual capacity of 600,000 tons of stone.

The Tennessee Coal, Iron, and Railroad Company owns in Alabama, Tennessee, and Georgia 307,000 acres of coal lands, 39,000 acres of iron-ore lands, 69,000 acres of undeveloped mineral lands, and 30,933 acres of miscellaneous timber and other lands, making a grand total of 445,933 acres.

RAILROADS AND REPAIR SHOPS.

The Tennessee Coal, Iron, and Railroad Company controls the Birmingham Southern Railroad Company, of Birmingham, Alabama, which operates 106.4 miles of track, 39 locomotives, and 629 cars. It also operates car repair shops at Pratt City, Ala.

Government Exhibit No. 341

(January 23, 1913.)

(Extract from pages 1346, 1347 and 1348 of "The Iron Age" of May 2, 1907.)

THE TENNESSEE COAL, IRON & RAILROAD COMPANY'S REPORT.

The forty-seventh annual report of the Tennessee Coal, Iron & Railroad Company, covering operations for the year ending December 31, 1906, has been made public by Chairman John A. Topping. The reports of this company have always been commendably full and clear, and the one just issued shows that the present management believes in maintaining the policy of giving stockholders complete information regarding the condition of their property. The report is so voluminous that only the chief points of interest can be re-

produced here. In opening, the report calls attention to the fact that a radical change has been made in accounting, both in respect to providing more liberally than heretofore for provisional funds, the necessary replacements and depreciation to plant and machinery, depletion of mineral lands, and by direct charges to costs for repairs and maintenance. Under these headings the net income for 1906 absorbed the following increased charges, as compared with the year 1905:

Fire and casualty fund	$52,253.44
Maintenance and repairs	266,121.76
Depreciation to machinery and replacement accounts	145,587.28
Total	$463,962.48

Exclusive of this amount, income was charged with $770,677.53 for depreciation and renewals. After making these liberal provisions for strengthening the properties, the gross income for 1906 shows an increase of $269,020.50 and the net income $59,053.47, in excess of the preceding year. The total income was the greatest in the history of the company, except for the year 1903, when present earnings were exceeded by $156,796.88, differences in accounting methods not considered. After providing for all necessary funds, the payment of all fixed charges and setting aside 8 per cent. on the preferred and 4 per cent. on the common stock, the net amount carried to surplus for the year was $126,881.02, as shown below:

INCOME ACCOUNT YEAR ENDING DECEMBER 31, 1906.

Earnings from operations after deducting charges for repairs and maintenance approximating $1,500,000		$2,753,159.85
Less provisions made for the following purposes:		
Exhaustion of minerals	$90,256.37	
Rebuilding and relining furnaces and coke ovens	317,853.07	

Replacements and improvements of machinery and plant at mines	170,422.32	
Replacements and improvements of machinery and plant at furnaces and steel works	192,145.77	
		770,677.53
Income from operations		$1,982,482.32
Miscellaneous income, interest, &c.		52,828.80
Total income		$2,035,311.12
Fixed charges:		
Interest on loans and taxes	$145,055.89	
Interest on bonded debt	791,338.00	
Dividends on guaranteed preferred stock of Alabama Steel & Shipbuilding Company	11,580.00	
		947,973.89
Net income		$1,087,337.23
Dividends:		
On preferred stock, at 8 per cent	$9,964.00	
On common stock, at 4 per cent	902,116.00	
On common stock partly paid, at 4 per cent	48,376.21	
		960,456.21
Surplus for year		$126,881.02

Following is a comparative statement of provisional funds:

	December 31, 1904	December 31, 1905	December 31, 1906
Replacements and improvements	$48,730.00	$180,331.32	$946,198.65

Relining and rebuilding furnaces and coke ovens	42,724.59	22,676.22	50,000.00
Accident or fire insurance and contingencies	213,331.62	159,158.98	155,828.73
Exhaustion of minerals	.....	.....	84,759.70
Totals	$304,786.21	$362,166.52	$1,236,787.08

The financial statement shows the company to be in a sound financial condition, with current assets of $3,004,480.09 in excess of current liabilities, as will be seen by the following balance sheet, as of December 31, 1906:

Assets.

Cost of properties:		
Land, buildings, plant and machinery:		
At January 1, 1906 as adjusted	$37,105,742.81	
Additions during year ..	1,613,499.36	
		$38,719,242.17
Capital assets of Birmingham Southern Railroad Company and investments in and advances to Allied Companies:		
Birmingham Southern Railroad Company	$1,122,973.90	
Potter Ore Company	400,879.35	
McCune Iron Company	32,693.31	
Ensley Land Company	260,930.67	
Tennessee Land Company ..	19,583.86	
Booker City Land Company.	32,840.55	
		1,869,871.64
Assets in hands of trustees of sinking funds, exclusive of redeemed bonds		40,455.31

Current assets:			
Inventories of materials, supplies and finished product at cost		$2,106,154.41	
Accounts receivable		1,552,512.67	
Bills receivable	$1,906,658.38		
Less discounted	1,321,083.32		
		585,575.06	
Miscellaneous investments		3,791.46	
Working funds in hands of agents		22,298.23	
Cash in banks and on hand		690,557.10	
			4,960,888.93
Deferred charges to operations:			
Prepaid insurance, &c			11,501.70
Total			$45,601,959.75

LIABILITIES.

Capital stock:			
Authorized	$50,000,000.00		
Issued:			
Common—			
Fully paid	22,553,060.00		
75 per cent paid	2,546,535.00		
25 per cent paid	847,675.00		
Advance installments	2,287.50		
		$25,949,557.50	
Less in treasury		18,540.00	
			$25,931,017.50
Preferred—			
8 per cent cumulative	$248,300.00		
Less in treasury	123,800.00		
		$124,500.00	

Alabama Steel & Shipbuilding Company ...$440,000.00		
Less in treasury. 247,000.00		
	193,000.00	
		317,500.00
Total		$26,248,517.50
Bonded debt:		
Tennessee Coal, Iron & Railroad Company	$ 9,568,000.00	
Subsidiary companies	4,351,000.00	
Potter Ore Company—$700,000 first mortgage 5 per cent bonds, guaranteed jointly with the Republic Iron & Steel Company, less latter company's proportion	350,000.00	
		$ 14,269,000.00
Deferred purchase money notes:		
Birmingham Southern Railroad Company—secured by collateral		1,101,849.20
Current liabilities:		
Accounts and bills payable	$ 1,289,622.40	
Interest due and accrued	390,391.23	
Dividends due and accrued	276,395.21	
		1,956,408.84
Special funds:		
Replacements and improvements	$946,198.65	
Relining and rebuilding furnaces	50,000.00	
Exhaustion of minerals	84,759.70	
Accidents, fire insurance and contingencies	155,828.73	
		1,236,787.08
Surplus		789,397.13
Total		$45,601,959.75

At the close of the fiscal year ending December 31, 1906, materials in inventory, due to lack of proper transportation facilities and consequent inability to move to market products sold, indicate excessive stocks and adversely affected earnings and volume of business. All materials listed were taken into the following inventory at actual cost, and in no case above current market value:

Finished product	$73,241.86
Pig iron	224,747.70
Billets, blooms, slabs, &c	379,794.52
Ores	45,277.87
Scrap	238,856.48
Ferromanganese	56,777.35
Fuel	99,299.67
Fluxes	27,502.91
Refractories	65,642.82
Rolls, molds and stools	160,169.61
Stores	265,700.72
Foundry and machine shop stocks	71,966.95
Live stock	62,025.00
Miscellaneous	9,135.43
Commissary stocks	346,762.56
Total	$2,126,901.45

The working capital, which on December 31, 1905, was $1,816,340.66, was increased during the year to $3,004,480.09.

In the preparation of the following comparative statement of income the accountants have taken the figures from previously published reports and classified the items entering into the results, so that all periods indicated are figured on the same accounting basis:

	1904	1905	1906
Gross sales and earnings	$9,607,578.74	$10,951,979.02	$13,265,970.66
Operating labor, material, &c.	$6,300,286.73	$6,764,699.87	$8,439,505.18

Repairs and maintenance	984,010.44	1,275,095.71	1,541,217.47
General expense, insurance, &c.	460,650.36	428,044.18	532,088.16
Totals....	$ 7,744,947.53	$ 8,467,839.76	$ 10,512,810.81
Earnings from operations.	$ 1,862,631.21	$ 2,484,139.26	$ 2,753,159.85
Less depreciation, renewals and replacements.	534,789.28	625,090.25	770,677.53
Totals....	$ 1,327,841.93	$ 1,859,049.01	$ 1,982,482,32
Add miscellaneous interest and fixed charges.	831,583.24	830,765.23	895,145.09
Net income....	$ 496,258.69	$ 1,028,283.78	$ 1,087,337.23

Additions to property in 1906 were as follows:

Land		$169,965.16
Ensley Steel Plant No. 1	$218,129.42	
Ensley Steel Plant No. 2	232,323.67	
Ensley Furnace	19,000.00	
General construction	116,019.97	
Furnaces Nos. 1-4	127,700.58	
No. 5 Furnace	216,924.55	
No. 6 Furnace	6,526.65	
Bessemer Furnace	8,656.26	
Bessemer rolling mill	4,999.87	
Pratt coal mine	164,849.38	
Blocton coal mine	121,981.81	
Blossburg coal mine	12,702.64	
Blue Creek coal mine	57,912.25	
Henry Ellen coal mine	3,704.81	

Whitwell coal mine	3,961.30	
Muscoda ore mine	11,035.94	
Fossil ore mine	30,665.92	
Potter ore mine	9,114.32	
Greeley ore mine	12,411.23	
Quarry (Ketona)	5,297.56	
		1,383,918.13
Total		$1,553,883.29

THE STEEL AND PIG IRON OUTPUT.

The physical condition of the mills has been improved by liberal expenditures, and, as shown by the income account, the cost of the work has been absorbed in operating charges. Further operations should benefit by this policy, both as to reduced costs and improved output. The production of rails, billets, steel bars and plates has been as follows in the past three years: 1904, 155,266 gross tons; 1905, 402,318 tons; 1906, 401,882 tons.

While a general rehabilitation of the old equipment has been taken care of by liberal maintenance, the Executive Committee has realized the necessity of increased steel and rail productive capacity, and has authorized the construction of a modern steel works and rail mill. These extensive improvements are expected to double the steel output and rail capacity, and radically reduce the cost of production. The benefits expected from these additions to plant will not be operative until the last half of 1907.

The same policy as applied to the steel works and rolling mills in respect to betterments and maintenance, has also been applied in building up the blast furnace department. Aside from the liberal expenditures appropriated for maintenance the work of reconstructing the entire Ensley group of furnaces along modern lines was authorized by the Executive Committee, and by July, 1907, three modern furnaces will be in operation, viz., Nos. 4, 5 and 6 Ensley. On completion of this work reconstruction methods will be applied to the remaining stacks of this group. The practical benefit of this work is now reflected both in lowered costs and by increased production. On completion of the work Ensley's

pig iron capacity will be substantially doubled. The pig iron production has been as follows in the past three years: 1904, 475,314 gross tons; 1905, 529,036 tons; 1906, 641,887 tons.

THE IRON ORE AND COAL PRODUCTION.

To meet the increased demands of the blast furnace department the Executive Committee has authorized liberal expenditures in opening up new slopes on Red Mountain, authorized the construction of a large number of tenement houses, and also an additional dolomite quarry at Ketona. These extensions are all under way and substantially increased production will be realized during the year 1907. In addition to these extensions heavy maintenance charges were absorbed at various operating points. The production of ore in the past three years has been as follows: 1904, 1,208,038 gross tons; 1905, 1,436,282 tons; 1906, 1,483,476 tons.

New mines known as the "Potter property," heretofore under joint lease to the Tennessee Coal, Iron & Railroad Company and the Republic Iron & Steel Company were during the year acquired by joint purchase with the Republic Company at a price and on terms exceedingly favorable to the Tennessee Company. Mineral experts estimate this property as adding 40,000,000 tons of high grade red ore to the company's extensive mineral holdings. Valuable acreage was also acquired at or near the Ketona dolomite property that will approximately double the dolomite or limestone reserves, and thus protect the blast furnace flux requirements for many years with a cheap and first-class stone.

Large appropriations have been authorized for the construction of seven modern coal washers, and within a few months the entire coal requirements for coking will be properly washed, and the coke produced will then be of a superior quality and the blast furnace economies extended. In addition to new washers, new mines are being opened and the facilities at old points strengthened, new houses for men constructed, and on the completion of this work a further increase than the gain for the year will be reflected. The coking capacity has not been extended, but has been increased by liberal repairs to old equipment, and further increases may

be expected from this policy of rigid maintenance. The production of coal has been as follows: 1904, 2,756,300 net tons; 1905, 2,231,659 tons; 1906, 3,007,657 tons. The production of coke has been as follows: 1904, 871,532 net tons; 1905, 890,631 tons; 1906, 1,186,872 tons.

The knowledge that the Executive Committee has acquired as to the tonnage and character of the iron ore, coal and limestone owned in fee simple by the company satisfies the committee that in wealth of raw materials required for the manufacture of iron and steel the company ranks as second to only one in the world, and is far in advance of any other iron or steel producer in cost of assembling its raw materials for manufacture. The mineral reserves of coal and iron contained in the company's lands, as computed by competent authorities, are estimated to be 700,000,000 tons of iron ore and 2,000,000,000 tons of coal. Approximately one-half of this coal supply is of a superior coking quality, and the iron ore is largely of a self fluxing character, analyzing approximately 38 per cent metallic iron. This ore is well suited to the manufacture of high grade foundry pig iron and to the production of basic pig iron for use in the manufacture of basic open hearth steel.

THE COMPANY'S TRANSPORTATION FACILITIES.

The Executive Committee, recognizing the great importance of controlling the company's own terminals and internal traffic, in order to secure proper continuity of the operations of mining and manufacturing, opened negotiations with the Louisville & Nashville Railroad and the Southern Railway Company for the purchase of the Birmingham Southern Railroad Company, and bought the property on July 1 at a price and on terms considered favorable to the Tennessee Company's interests. The Birmingham Southern Railroad owns valuable terminals, not only in the city of Birmingham, but also at Ensley, Pratt City and Bessemer, Ala., and aside from the advantage of controlling transportation in assembling raw materials for conversion, this property has great potential value.

A list is given of the properties owned and operated,

showing 16 blast furnaces, of which 6 are at Ensley, 5 at Bessemer, 2 at Oxmoor, 1 at Birmingham, Ala., and 2 at South Pittsburg, Tenn.; steel works at Ensley, comprising 11 50-ton basic open hearth furnaces, 1 250-ton primary furnace, 1 15-ton Bessemer converter, blooming mill, rail mill, &c., and in process of construction 2 20-ton Bessemer converters, 4 65-ton open hearth furnaces and a 36-in. rail mill of 25,000 tons monthly capacity; rolling mill at Bessemer having 24 single puddling furnaces, muck mill and bar, guide, plate and fire bed mills. It also gives a list of the ore and coal properties and the location of the company's 2,974 coke ovens.

The report states that the labor situation, due to scarcity of efficient common and skilled labor, has detrimentally affected operations, as the extensive construction programme under way has called for a large increase in working forces. To meet the increase demanded by enlarged mineral and manufactured output, the management adopted the policy of shipping labor from all available points, the expense of which was absorbed in costs; but with less heroic treatment operations would have been more seriously affected. "Permanent relief, however, will not be secured until intelligent labor and skilled workers can be secured by proper immigration efforts. This situation is now recognized by the State authorities of Alabama, and aggressive steps have been taken by establishing a State Immigration Bureau, the appointment of a Commissioner of Immigration and the enactment of proper immigration laws to provide for and stimulate direct immigration of desirable labor from abroad. It is gratifying to state, in this connection, that all labor troubles have been removed by the Miner's Union declaring off the strike that has been in force for several years, and labor is now peacefully employed and is receiving full competitive rates for services."

The average number of men employed in 1904 was 8,680; in 1905, 10,414; in 1906, 11,857.

The unfilled orders now on the company's books represent the largest tonnage in its history. Unfilled orders as of January 1, 1907, called for the following: Manufactured iron and steel products, 467,114 tons; coal, 1,200,000 tons; coke, 201,700 tons.